S: Schwimmer E-4,5 (1966-1967) 1973
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Mountain Orokaiva

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Fig. 1. Popondetta Sub-District: generalised land classification

5: Schwimmer E-4,5 (1966-1967) 1973
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CHAPTER II

THE SETTING

1. *Geography*

Although several good descriptions of the physical environment and general culture of the Orokaiva are available (e.g. Williams 1930, Waddell and Krinks 1968), a brief sketch of the setting of this study may be convenient. The Orokaiva live in the Northern District of Papua, a district bounded on the south-west by the Owen Stanley range, on the west by the Mandated Territory of New Guinea. Although the administrative centre of the district, Popondetta, lies only about 150 miles from Port Moresby, there is no road connection, so that the only communications with the outside world are by air and sea.

The Orokaiva live on the footslopes of Mount Lamington and on the plains to the north and east of these footslopes. This region is, by New Guinean standards, highly favoured by nature, as Brookfield recently emphasised (1966). In a classification of the natural resources of New Guinea according to the degree of limitations to land use[1], Brookfield describes a large territory surrounding Mount Lamington as 'suitable for cultivation with a mild degree of limitation'. This comprises 'some of the largest tracts of such good land in the whole country' (*ibid.* 47–8).

One distinguishing feature of the region is its lithological composition: there is an abundance of Pleistocene and recent volcanic deposits. The total area of such recent ash and lava deposits found in New Guinea is small, but notably fertile. Brookfield maps the annual rainfall of the region as between 100 and 150 inches. This is not so high that the land becomes permanently or semi-permanently waterlogged. On the other hand, the region mostly lacks well-marked dry seasons during which the soil would rapidly dry out. With regard to terrain, the region has extensive areas of low and moderate relief and good drainage. As for density of population, Brookfield paints a somewhat idyllic picture that needs correction: 'the greatest concentration of population, rising locally to 60 per sq. mile, lies on the best land in the area – the little-dissected footslopes of Mount Lamington, where smooth topography is combined with fertile soils and good drainage' (*ibid.* 64).

We find, in fact, that local densities of 200 and more per sq. mile are not at all rare (Rimoldi 1966: 4). In two villages I surveyed, I found population densities to be 180 (Sivepe) and 135 (Hohorita) per sq. mile. Rimoldi's analysis shows that the Sivepe population density is close to the upper limit the land can sustain with present technology and social organisation. The sample he chose (50 persons of the Jegase and Timumu clans) happened to have under-average land holdings, of 138 acres. Rimoldi shows that 110 of these acres are needed for

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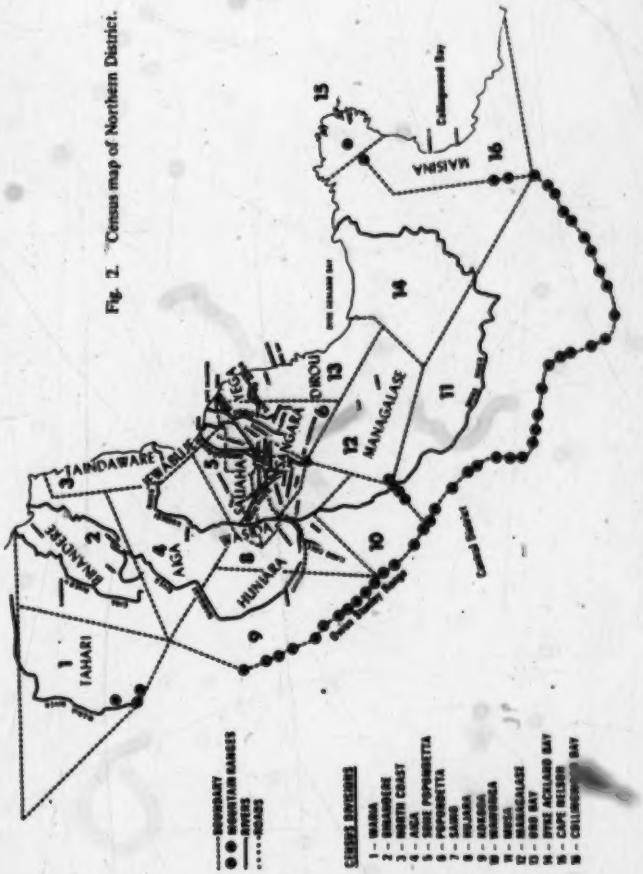

Fig. 2. Census map of Northern District.

5: Schwimmer E-4,5 (1966-1967) 1973
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Mountain Orokaiva

subsistence shifting agriculture alone. This leaves hardly any margin for land unsuitable for cultivation, for bush land needed as a source of building materials etc., or for unequal distribution of land as between families.

We may divide the land occupied by Orokaiva into two broad sub-regions. The first is made up of the foothills themselves which have an 8 to 12 inch very dark brown top soil, rich in nitrogen and phosphorus. The fine-textured subsoils range from 10 to 22 inches in depth. This sub-region coincides approximately with the Saiho census division which had a population of 8,211 in 1966 giving a density of about 55 per sq. mile. The second sub-region, situated to the north and east of the first, consists of poorly drained but readily improvable plains. Here the population is very much sparser. Most village domains contain only a fraction of immediately utilisable good cultivation land and even this does not have the special fertility of the volcanic loam on the mountain slopes. The soils of Inoda, a village situated in this sub-region, have been discussed in much detail by Crocombe and Hogbin 1963, quoting the Commonwealth Scientific and Industrial Research Organisation (C.S.I.R.O. [1954]). This sub-region forms part of the Sohe-Popondetta census division which, as a whole, has a population density of about 20 per sq. mile. Villages are smaller and more dispersed.

The boundaries of what we may call the Orokaiva tribal area are probably best determined by the criteria used by the Papuans themselves, namely linguistic criteria. Orokaiva is part of the Binandere group of eight languages (see Wurm 1960) spoken in most of the more densely populated parts of the Northern District; of these languages, Orokaiva is spoken by the greatest number, but only about half the population in the Ovokaiva-Binandere area. The only language of this group for which a reasonably full description (grammar and dictionary) has been published is Binandere (Copland King 1927), a language spoken around the lower part of the Mambare and Gira rivers. Other languages of this group are: Orokaiva, Notu, Aiga, Huniara, Yema, Taindaware. While there are considerable vocabularly differences between these languages, there is a close resemblance in grammar and enough resemblance in vocabularly to make a very limited degree of intercommunication possible. (Chinnery and Beaver 1916 and an unpublished manuscript by Capell [n.d.]). We do not know much more about the Binandere group of languages except that it is a Papuan grouping (Grace 1968).

It seems to me that dialect divisions within the Orokaiva language area which have been noted at various times (Beaver 1916, Williams 1930) are rather minor. A fairly accurate idea of the boundaries of the Orokaiva language area may be obtained by identifying this area with the district administered by the Higaturu Local Government Council which covers the Saiho and most of the Sohe-Popondetta census divisions.

Williams (1930: 157–9) attempts to distinguish the Orokaiva language speakers from other tribal groupings by listing cultural differences (notably in dress and ornaments) but these are not pronounced and, under modern conditions, may be observed only on ceremonial occasions when headgear and bark-cloth are worn.

Prior to European contact, the normal mode of settlement was in hamlets containing 6 to 12 houses and surrounded by land used for shifting agriculture.

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5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
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making salt were described to me, the housewife depends mainly on trade salt. Meals never consist of more than one course. Plates, forks and spoons are owned by all households but people do not always use them. While boiling is the most common way of preparing food, bananas, yams and breadfruit are usually roasted. Meat is often preserved by daily smoking, sometimes for long periods. There is a rule against eating meat 'in lent' and this is kept very strictly, but probably for traditional religious reasons to be discussed later. The main drink with meals is a soup consisting of the water in which the vegetables and herbs were cooked.

Foraging. A good deal of plant and animal food is obtained from foraging, especially in the tropical rain forest which covers most of the Northern District. Among foraged animal foods I would mention especially grubs, frogs, snails, rats, bush eggs and lice. Foraged plant foods are especially valued during the dry season when roots, leaves and fern fronds may make up part of a meal. Savoury herbs and leaves, however, are collected at all times of the year. Some food plants, though growing in the forest, are owned by individuals so that the gathering of these plants may be better described as harvesting than collecting. The most important are the *tauga* and *puga* nut, sago, breadfruit, wild fig, and fruiting pandanus.[4]

Hunting. According to Waddell and Krinks, about two man-hours weekly are spent on hunting (3.7 hours by men and 0.3 hours by women). Hunting patterns on the Mount Lamington foothills differ widely from those on the alluvial plains where kunai grass is widespread. On the foothills, there is hunting in reverted gardens and in very limited areas of virgin bush. The usual quarry consists of small marsupials and birds. If a pig is encountered, it is invariably a village pig whose owner has a claim to the carcase. The game population was virtually exterminated after the introduction of guns in the 1950s. In the kunai country, on the other hand, hunting land is abundant. The technique is by firing the kunai so that the animals can be shot when they escape. Such a hunt requires a large number of men who ring the burnt-over area. Not only marsupials but also pigs are killed, either by gunfire or by being roasted alive in the kunai grass. By no means all animals killed in the fire are retrieved. Fires tend to get out of hand and to spread over surrounding bush land which then is often covered with kunai grass and so is useless for purposes of cultivation.

Fishing. The supply of fish has suffered greatly with the introduction of snorkels after the Second World War, as this equipment enabled the Orokaiva to fish out their rivers almost completely in a very short time. Fish is still an important resource, however, in the lower reaches of the huge rivers which run through the Northern District: Kumusi, Ambogo, Girua, Sambogo, etc. In Inonda, the village studied by Crocombe and Hogbin (1963) and Waddell and Krinks (1968), 3.8 man hours per week are spent on fishing, mostly with spears, and the product is used not only for consumption but also for trade. (Inonda people also trade meat and bush eggs.) Many of the villages near the mountain, such as Sivepe, have very little fish. Apart from a few eels and crabs, the rivers contained a small supply of two-inch-long fishes caught in April with a small hand-net used as a scoop. (See Williams 1930:53 for description.)

Animal Husbandry. There are three kinds of domestic livestock: pigs, dogs and fowls. Every man still has one or more small dog which he uses for hunting

5: Schwimmer E-4,5 (1966-1967) 1973
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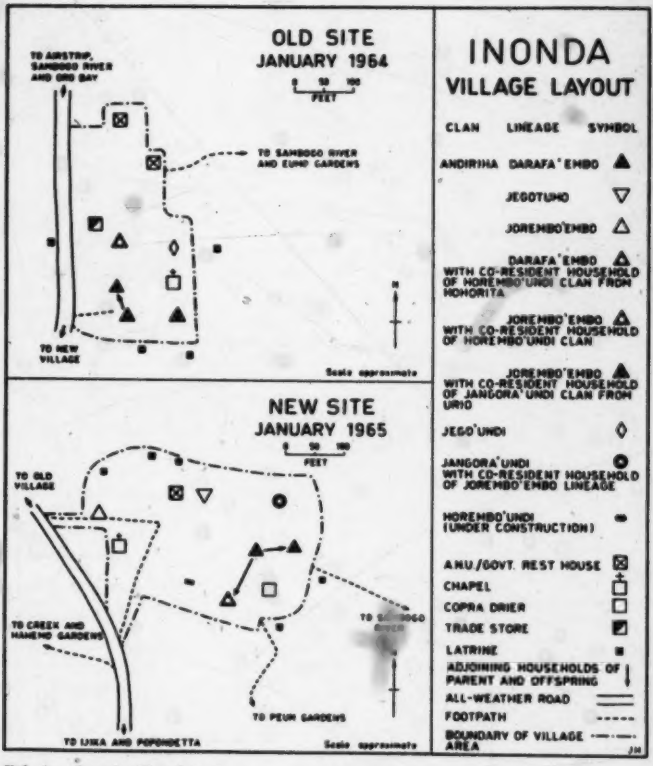

Fig. 4. Inonda village layout.

The leader, a government driver, earned about 65 per cent of the total cash income of the whole village, not only in wages but also through various enterprises on the side. He was the lay preacher as well. The only limit to his influence was the unwillingness of the pagan faction to become involved in 'modern' activities of which he was the champion. 105 622 177

Ecologically, Inonda is characteristic of the alluvial plains region to the east of the mountain. It lies between 200 and 300 feet above sea level, and has a comparatively low rain-fall and long dry periods. Its population density is low: 42 people on a village domain of 2850 acres (less than 10 per square mile). The best Inonda land is 580 acres of coarse-textured recent riverine deposits, covered with forest or regrowth and lying beside the Sambogo and Girua rivers. 133 132 161 162 134 137

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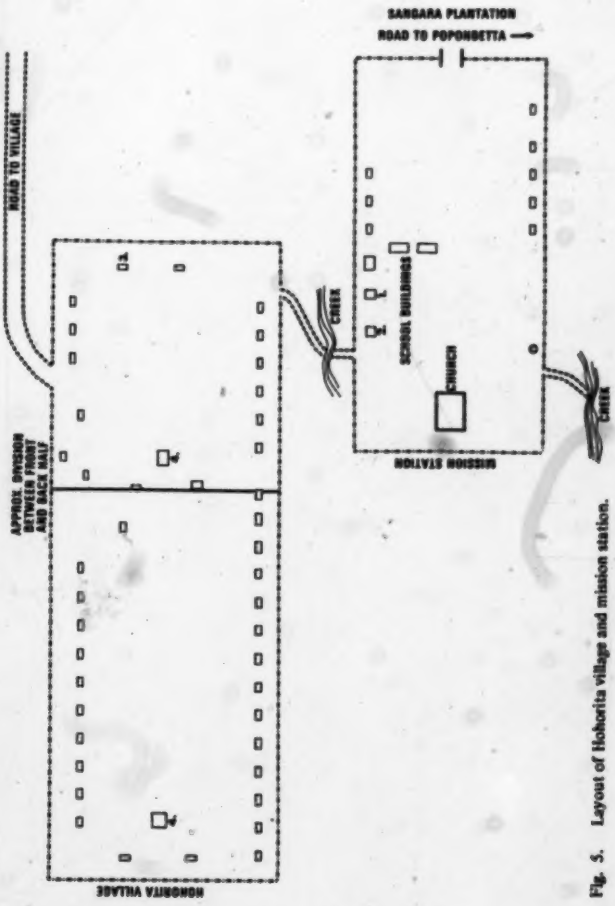

Fig. 5. Layout of Hoborita village and mission station.

5: Schwimmer E-4,5 (1966-1967) 1973
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Hohorita. My stay in Hohorita lasted for a month, and I made several return visits. This village lies thirteen miles from Popondetta on the road to Saiho, has forty-one dwelling houses and a population of 358. Hohorita and three contiguous hamlets are the home of the Sangara who survived the Mount Lamington disaster. The Sangara population was reduced by the eruption from some 3,000 to 195 people, who stayed together in the evacuation camp and later founded Hohorita, where the remnants of about a dozen clans may be found. By far the strongest clans in this village are those whose homes, at the time of the eruption, were at the outer edge of the devastation area and who were able to run away from the *nuée ardente* before the searing blast could reach them.

Hohorita, though built much earlier than Inonda (1957), was not beautified with the same care. The area between the two rows of houses was bare, except for some coconut and betelnut palms. The village was divided into two rectangles by a short row of houses. The front and back part were settled at different times and different clans were dominant. When I was working in the front half I would meet hardly anyone from the back half and vice versa. A feast house had been built in both the front and the back sections of the village. The feasts had been held just a few weeks before my arrival, to entertain neighbouring villages. Originally a combined feast had been planned, but disagreement had prevented it. There was no chapel in the village, but a mission station just next to it, with a white mission teacher, a mission school and several Papuan teachers who were in charge of church services. This was a contrast with Inonda, which was several miles removed from a school and even further from a mission. There was a woman's club with a small club house, but again this was supported by only a small minority.

Hohorita was entirely Christianised, in the sense that everyone had been baptised. A number of the older men had been educated in a mission station prior to the eruption and had become mission teachers while evacuated. When coffee became a lucrative cash crop – more lucrative than teaching – many of them had retired to the village. As a result the leadership pattern differed sharply from Inonda. About twenty men in Hohorita had held down occupations requiring some European skills, and these men tended to work out together the everyday and long-range decisions required in the village. The leading personality was, at that time, a well-educated man, who for years had been the chairman of the Higaturu Local Government Council. In Hohorita virtually everyone was growing coffee. Some men worked in the plantations nearby.

Ecologically, Inonda is characteristic of the alluvial plains region to the east Lamington foothills. Before the eruption, the concentration of population was entirely on the higher reaches of the tribal domain as rainfall and fertility are higher there. The lower portion of the territory, away from the mountain, was used for hunting. But the government discouraged reoccupation of the higher land, for fear of further eruptions. Hohorita is lower down than the old villages. The more elevated land is used a little less than before, and often for coffee rather than subsistence crops. The topsoil is volcanic loam; the rainfall is probably between 120 and 150 inches per annum. Population density is 135 per sq. mile. This is a little less than is usual on the Mount Lamington foothills, but prior to the eruption the population must have been very dense indeed.

Sivepe. I stayed in Sivepe for about nine months, from September 1966

5: Schwimmer E-4,5 (1966-1967) 1973
OJ23 Orokaiva OJ23
Mountain Orokaiva

101 until June 1967. Previous intensive studies had been made there by Rimoldi and
105 Waddell. Sivepe is twenty-four miles from Popondetta, but this distance represents a drive of two to four hours in a Landrover, according to the time of year. The village lies on a side road, serving a population of some 2,000 living in the valley of the Sasembata (or Hembe) and Sohu rivers, two tributaries of the Kumusi. This side road runs from the main road in a south-easterly direction as far as Kendata. The Sasembata-Sohu valley combines all the most favourable ecological conditions: heavy rainfall, deep volcanic loam, excellent drainage, easy contours. The first time I drove to Sivepe was during the dry season. Turning from the main road, I found myself on a slightly improved grass track, with villages built right across it, the sweet aroma of coffee trees (which, incidentally is strongly disliked by the Orokaiva) pervading the atmosphere, lush vegetation, and a life-style on which the Europeans had apparently made much less impact.

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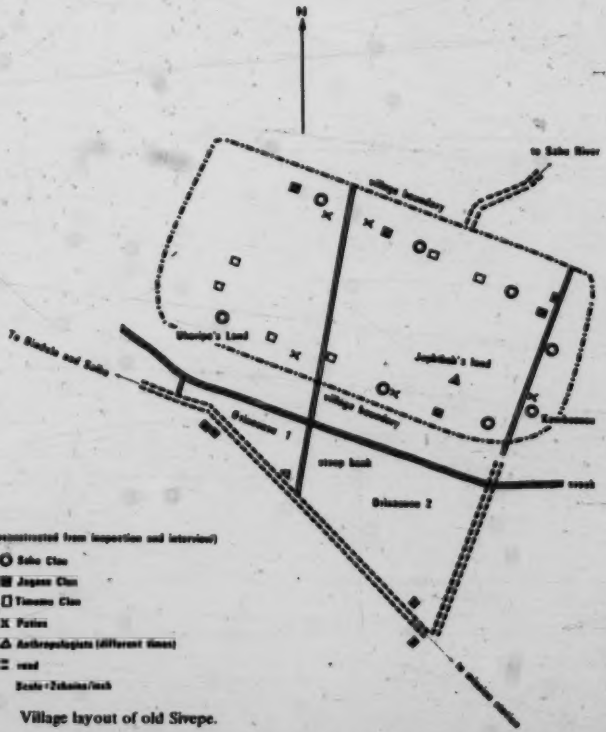

Fig. 6. Village layout of old Sivepe.

5: Schwimmer E-4,5 (1966-1967) 1973
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Mountain Orokaiva

Sivepe has twenty-four dwelling houses and a population of 137. The two politically dominant clans are Jegase and Seho, but some families from the Sorovi clan had not long ago migrated to Sivepe from a neighbouring village (Garombi). Sivepe had been shifted recently to the present site so that decorative borders were not yet established, though such improvements were started during my stay. It was planned that the village would be rectangular in shape, with two long facing rows, as in Hohorita and Inonda, but a third row, supposedly temporary, had been established on the hill behind the planned site. In other respects, however, the same standard of village layout had been followed. The houses were roomier than in the other villages and had walls of horizontally laid shingles, an innovation of which the villagers were rather proud.

Sivepe has no chapel, but the Anglican mission station is less than a quarter of a mile away from the village. The school conducted on the station is one of the best in the Northern District; it teaches up to grade six and many of its students qualify for admission to secondary schools. The station also maintains a small field hospital, with a Papuan assistant medical officer in charge. For more serious cases the large government hospital at Saiho was used, a facility serving the whole of the Northern District, but in practice out of reach of distant villages like Inonda. Hohorita people, however, use it frequently.

Sivepe has been Christianised only very recently. There were no baptisms until after the eruption and the Seho clan did not join the Church until about 1963. Today very few pagans are left and they do not form a political or other faction. Leadership is shared between several strong personalities. Sivepe lacks residents who stand out by superior wealth or European education, but is rather more homogeneous in that respect than either of the two other villages. Money comes mainly from coffee and from remittances sent by relatives working outside the village.

Sivepe, like most of the Sasembata-Sohu valley, has an extremely dense population – about 180 per sq. mile.

REFERENCES

1 Brookfield uses the Klingebiel and Montgomery (1961) classification of land which distinguishes land areas by the degree of limitation to land use imposed by geographical conditions. Limitations may be due to terrain, lithology, soil, or climate. A large territory surrounding Mount Lamington falls in classes I to III (which means it is suitable for cultivation with a mild degree of limitation), as contrasted with most of the rest of New Guinea, where the limitations are much greater.

2 Figs. 1 and 2 give a general impression of the geography of the district: land systems, natural features, settlements roads, tribal areas, etc. Table II/1 shows the distribution of population in the Northern District of Papua. Table II/2 shows the age breakdown of the population in Sivepe and Inonda. Table II/10 shows rather strikingly how suddenly labour migration began: the men of the Seho clan of Sivepe were just a little too old to have been involved, but the Jegase clan, whose members were slightly younger, mostly spent some time on jobs outside the village before or shortly after marriage.

3 Orokaiva: *jna*; botanical: *saccharum edule*.

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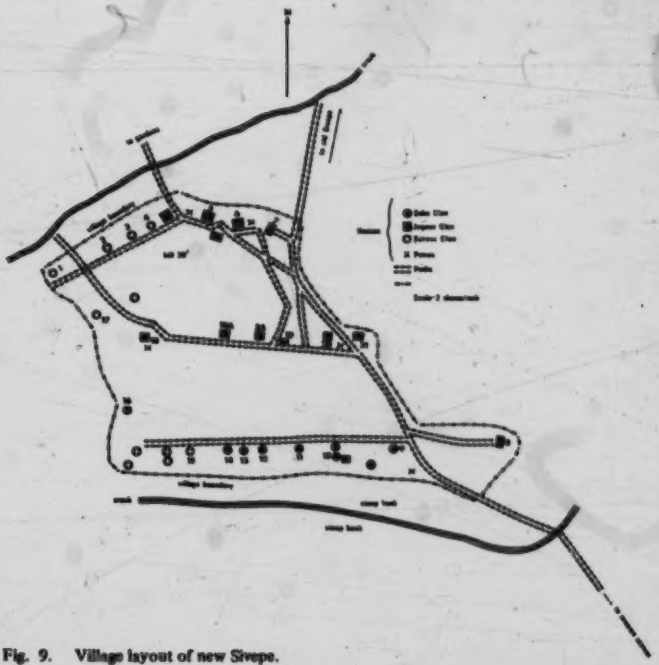

Fig. 9. Village layout of new Sivepe.

361 616 614 621 rather irregular pattern. Village plans of Sivepe drawn by Rimoldi and Waddell in 1963 and 1964 show no formal separation between the clans. Some neighbouring villages, such as Garombi, however, did allocate one side to each of their two clans. The fact that Sivepe introduced this pattern in 1965 has no particular explanation except that it appealed to the Seho clan leader who supplied the land for the village site. One might describe his innovation as an idiosyncrasy or a fashion but at the same time it is significant that the pattern of residence he introduced resembles that familiar to anthropologists in the many parts of the world where exogamous moieties are found.

583 616 121 I have now shown most of the evidence for direct marriage exchange and forms of dual organisation. The question that remains to be answered is why this system was so fitfully practised. Are the discrepant cases to be explained merely by organisational factors such as lack of choice, the vicissitudes of war, the need for alliances? Or are there present in the culture a further set of rules related to marriage which we have not yet considered and which are irreconcilable with the principle of direct marriage exchange?

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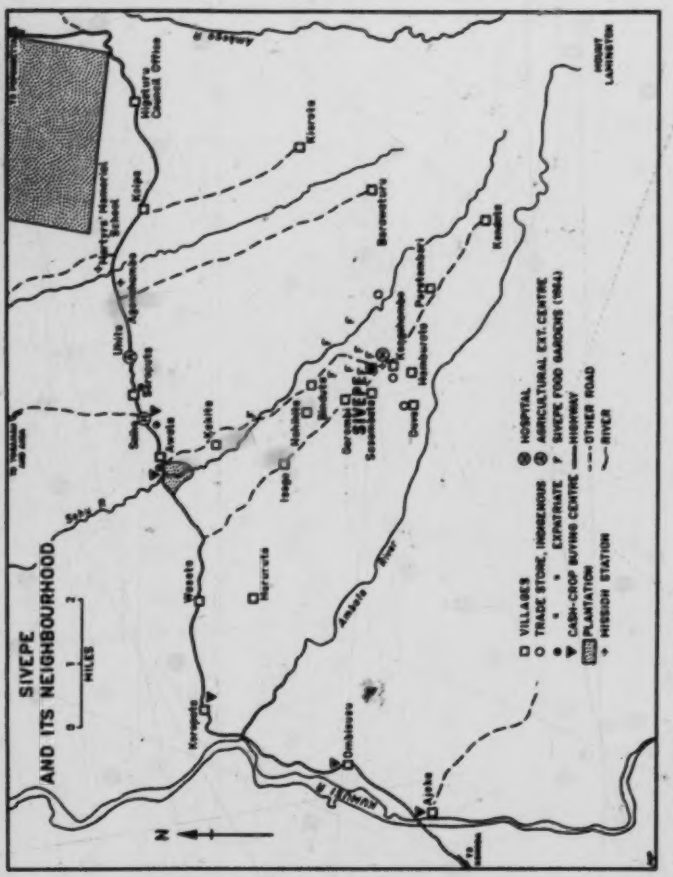

Fig. 10. Sivepe and its neighbourhood.

the men who carried the coffee to Higaturu each Saturday were each given a stick of tobacco. By 1950 the basis of payment had been changed and producers were paid immediately and in cash for their produce.

The post-war drive did not last long and when official pressures were relaxed production dropped markedly. During 1949-50 extension staff made a further attempt to revive the scheme: seven plantations in the Higaturu area were fully rehabilitated and similar work was proposed for the plantations east of Popondetta. New processing equipment was purchased and a new coffee factory built at Higaturu, but it was hardly completed when Mt. Lamington erupted early in 1951 destroying the factory and many of the plantations as well. Production from the plantations scheme ceased as a result of the eruption, but it is doubtful whether it would have continued for long in any case. The price was low, (1) no external sanctions were imposed (and the people were not permitted to impose their own sanctions) and in many instances there was dispute over the shares to be given to landowners, supervisors, and others. In 1955 extension staff made a third and final attempt to revive the scheme, but it too met with little long term success.

No precise production figures are available for the plantations scheme in the Northern District, but as this scheme produced most of the coffee exported from Papua, total exports from the colony give an indication of the pattern which applied in the Northern District. These are listed in Table 3 below.

(1) In 1950 coffee was being bought in cherry at 2d per pound which is equal to about 10d per pound for parchment coffee. Data published in P.A.R. 1949-50 : 17 show that 40,100 man-hours were worked on the 56 acres of coffee then in production and that £767. 12. 3 was received from coffee sales. Making no allowance for establishment costs, this represents 4½d per hour worked.

Appendix F

The Orokaiva villager's experience of cash cropping

241 177 [114]

While the writer was conducting research into communal plantations in some villages, an assistant, Mr. Edric Eupu, visited others. The following brief extracts from two of his preliminary reports indicate the natuve of the villager's experience of cash cropping, and help to explain the current lack of enthusiasm on the part of many Orokaiva for further experiments.

Ahora Communal Garden

Before the war there were four cash crops planted at Ahora: coconut, cotton, cocoa and coffee. The coconut was planted on two clans' land. The names of the two clans were Huruba and Gambe. There were three villages took part in the work. The names of the villages and clans who took part in the work were ....

245 [258] 248 465

They planted coconuts but did not make any copra. [There was no market for it at the time]. The coconut was ready to make copra, but the Government officer at Buna told the people to plant the cotton. The cotton was planted on Gambe clan's land ..... The people worked one year for the cotton without pay .... When the cotton was ready .... they picked it and took it to Buna (government station) .... and they got paid. The pay was 1/- for each man in the three villages for the work they had done for the cotton. After they got the pay the work on the cotton stopped.

245 [465] [133]

Then government told the villagers to plant the cocoa and they planted. It was planted on Gambe clan's land. The cocoa bore and they took the pods to Buna. Government paid for the pods [but the pay was insufficient] .... Then the coffee was planted on Huruba clan's land .... The people used to work every day .... The pay for the coffee was about 5/- to every man each year. While they were still doing this the war came. After that they did not work until Mt. Lamington erupted.

Hamburata Communal Garden

Before the war there were four cash crops planted at Hamburata: rice, coconut, palm oil and coffee. The rice was planted on Atupa clan's land. Five villages took part in the work .... There were 29 clans .... The villagers worked for the rice for one year without any pay. The rice was harvested in bags .... The people brought the bags of rice to Buna but the government did not pay them for the work they did on the rice. They worked for the rice for one year only ....

The second crop planted at Hamburata was coconut. The coconut was planted on land of Atupa clan .... The coconut plants were still young when the villagers were told by the government to plant another crop. The crop was palm oil .... The palms were planted on Haumepa clan's land. The villagers planted the oil palm and looked after them for one year and the government told the people to plant another crop. The other crop was coffee.

The coffee was planted on Seharipa clan's land .... They worked every day .... They got pay once in every year. The government officers used to come to the village. The government used to send police to the village to look after the people to work on the coffee .... When the war was near the government did not send the police to the village for this work. After that all the people in the village stopped work .... After the war they did not work on the plantation until the Mt Lamington eruption. The coffee was near the Ambogo river so the river was flooded and washed the plantation away ....

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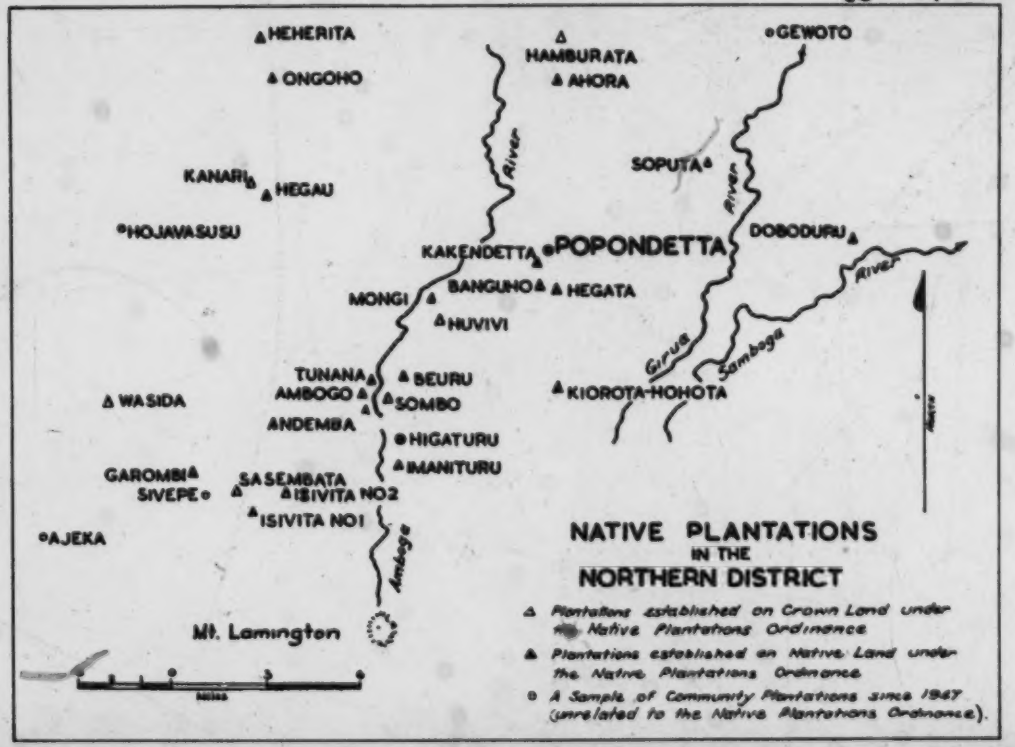

6: Crocombe E-4,5 (1963) 1964 0J23 Orokaiva 0J23

423 obstacles,[1] but the policy of registering villagers' land was being implemented at the time of our surveys.

121 Inonda and Sivepe alike had experience with their council's registration scheme. The principal reason for working with these villages in particular is that they may be regarded as typical of two extremes among local communities in the council area. The following conspicuous variation was taken into account, in view of the need to investigate the relation of local conditions and problems to economic change in general and to the council's tenure scheme in particular.

161 Sivepe is located in the Saiho Census Division which has an overall population density of 75 persons per square mile, but there are local concentrations of much higher density, for example, 237 persons per square mile at Sivepe;[2] the density of the Saiho Division is the highest in the Northern District and the third highest among the rural census divisions in Papua,[3] but does not approach the densities found in several places in the New Guinea Highlands.[4] The density of the Buna Census Division where Inonda is situated is about 8 persons per square mile, the lowest among the Orokaiva.

133 The average size of Saiho villages is about 175 persons, compared with an average of 100 in the Buna Census Division. The
132 Sivepe people live on the highly fertile slopes of Mt Lamington, receiving an annual rainfall of about 160 inches; Inonda's land
131 is lower, flatter and comparatively poor and receives about 95 inches a year. Inonda is 11 miles from Popondetta on the road to Oro Bay and Sivepe is roughly twice as far from the township, along a road leading inland.

101 For brevity we will speak of the 'mountain Orokaiva' as an
[133] alternative to 'Mount Lamington Orokaiva'. (See Keesing 1951:5-6.)
[162] This group, we believe, was the largest socio-political unit, the

[TEXT CONTINUED ON PAGE 6]

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[1] For an account of the developments of the registration scheme see Crocombe and Hogbin 1963:89-93.

[2] Population is over 8,000 and there are 8.6 acres available per head in the census division. The personal opinion of at least some local officers has been that local densities of 200, and more, persons per square mile are not at all rare in the division.

[3] After Kaipi, Gulf District and Kubuna, Milne Bay District.

[4] However, Keesing (1951:2) maintained that these Orokaiva on the Mt Lamington slopes achieved 'perhaps the densest settlement patterns of any of the shifting "dry" cultivators in the New Guinea area'.

7: Rimoldi et al. E,I-5 (1962-1963) 1966 QJ23 Orokaiva QJ23
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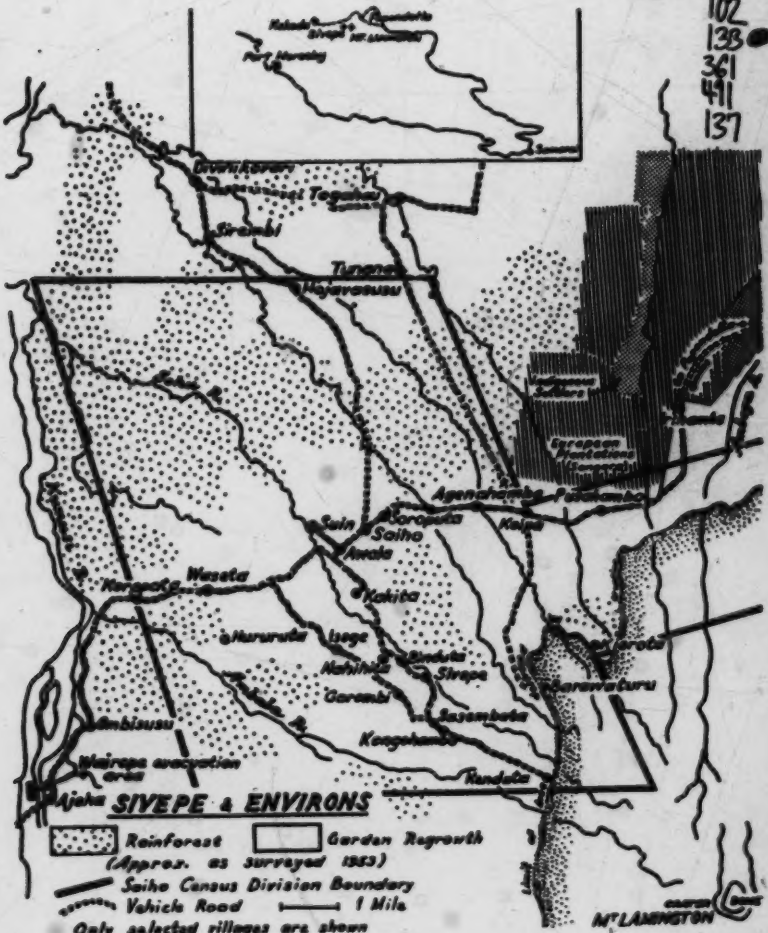
Sivepe

MAP 1



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pl. 18

E,I-5

tribe, which included Sivepe. It occupied the volcanic slopes under fairly uniform and distinctive ecological conditions. The mountain Orokaiva now include roughly the 8,000 people in the closely-settled Saiho Census Division areas, that is, the people who have been called 'Wasida' or 'Periho'. They also include the members of the few adjacent villages who are the only 'Sangara' people surviving the 1951 eruption of the volcano.

Belshaw (1951:2) reported that among the mountain Orokaiva until 1951 'the residential group...consisted of a number of separated hamlets.... Hamlets grouped themselves together under a common name, such as Wasita 1, Isivita 1, Isivita 2 etc.... Each hamlet group, or "village" in administrative parlance, was separated geographically from its neighbouring hamlet group'. The two 'villages', Isivita 1 and 2, had comprised 19 named 'hamlets' and represented the Isivita 'native district' which, Plant[1] (1951: Appendix 4) says was joined with the Sasembata (8 hamlets), Koroputa, Wasita, Awala, Soroputa, Sairopi, Mumuni and Wairopi districts[2] to form the Periho tribe. This 'closely approximates to' what Williams called the Wasida tribe.

Shortly before the eruption of Mt Lamington in 1951, Sivepe, Binduta, Mahihita, Pusahambo, Korinasusu and Heherita[3] were grouped under the name of Awala 2 and had a total population of 250,[4] compared with the range of 150 to 400 which Belshaw (1951:2) attributes to 'hamlet groups' in the area. There is a radical difference in size between the small hamlet described by Belshaw and the characteristic nucleated village of post-eruption years (excluding interim evacuation 'camps'). Nevertheless, we hereafter refer to both as a 'village' when not quoting. This does not

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1 Plant uses the term 'village group' for Belshaw's 'hamlet group' or 'village'. Williams (1930:131) refers to Belshaw's 'hamlet' sometimes as a 'village' and sometimes as a 'village group'.

2 He earlier (1951:3) omitted Mumuni and Wairopi - see p.31. On Map 1 see Hururuta for Mumuni District, and Ombisusu-Ajeka area for Wairopi District; the Sairopi people are about 4 miles south of the Mumuni.

3 The last 3 'hamlets' were not re-formed after the eruption; another which was established about this time took the name Awala No.2.

4 In a sample of 50 nearby hamlets in other groups in the Saiho Census Division the average hamlet size was 36 persons as against 41 in this group. Note also that in 1923 the Awala hamlets (including those in Awala 1) may have numbered 15 (Williams:W.83).

Chapter 2

The subsistence economy

a. Climate and soils

134 (133) 132 The neighbourhood has a warm, moist climate with an average annual rainfall of 160 inches (see Appendix C). Sivepe is between 1,250 and 1,300 ft above sea level and nights are often cool. According to the C.S.I.R.O. soils survey (1954:11), the village is on a soil association of the Awala land system which has an 8-12 inch very dark brown top soil. Chemical tests suggest that these loams are fertile, rich in nitrogen and phosphorus. The fine-
133 textured subsoils range from 10 to 22 inches in depth. The terrain is characterized by a gentle radial slope on wide planar ridges between the larger steep-sided streams flowing from Mt Lamington (5,634 ft) into the Kumusi River. Numerous smaller creeks, together with these streams, form an effective fine-textured radial drainage system.

823 134 The local people recognize 5 types of soil based on differences of colour, texture and moisture.[1]

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[1] (a) Hohori - any red soil; 2 subtypes are distinguished: i. without sand. This is popular for cultivation; ii. sandy. Avoided if possible as taro does not grow well in it.
(b) Gindiri - any soil which is stony or has a high sand fraction. It may be used for cultivation but in the dry season taro grown in it becomes stunted and the corms are small.
(c) Mume - this soil is the predominant type in the area. It is the dark brown loam described in the C.S.I.R.O. report as covering almost the whole of the soil association. It is certainly the most widely used and together with Hohori, type i., it gives the best yields.
(d) Pusu - any clay. Taro growth is stunted.
(e) Pegara - swampy or waterlogged soils. These are sometimes used during a dry season.

A, [See Category 132, p.109--Analyst]

231 some toll on growth rates, size and length of life. Sows are quite prolific, however, and litters of 6 to 10 piglets which survive weaning are common. Boars are not numerous but it is claimed that the owner charges no fee for their services.

It is doubtful whether improved breeding and husbandry could [431] in themselves induce a significant increase in the consumption of meat by pig owners. Pigs are too scarce in this area to meet the existing demand and priority is given to the use of pigs for [435] distribution as pork at feasts or for gift exchanges. Very often neither a man nor his close kin have a suitable pig available when needed and in one such instance a price of £20 was set by the owner of a pig in another village.

Any person who aimed to establish a herd of significant numbers for commercial purposes would probably need to divorce himself as a participant from the network of exchanges which involve pigs.

245 e. Economic trees

[131] Although the village is 23 miles from Gona on the coast and over 1,000 ft above sea level, most economic trees are abundant. [133] The average household claimed 62 trees from which crops are gathered in season.[1] In order of numerical importance these were coconut, breadfruit, areca (betel) nut, sago, pandanus and tauga-nut (Cycas media) trees. Each household also owned one or two [137] citrus, puga-nut (Terminalia okaria), mango or barkcloth trees. Sago does not grow wild in this area as it does on more low-lying land, but numerous small creeks provide sites suitable for planting. The 93 sago trees owned by Jegase and Timumu people are sufficient to meet the intermittent demand for sago for distribution at large gatherings or during the occasional period when there are limited amounts of the more common crops ready to be harvested from the village's gardens. Whenever a tree is harvested the owner is expected to share the sago widely with the other villagers whether they are his agnates or not.

Most villagers had lived in several villages, some of which are now abandoned, and had planted coconuts there which they still claim. They usually had similar numbers scattered over parcels of land where they had gardened in the past. Sixty-two per cent of all trees had been planted on the patrimonial land of the [428] person claiming the trees. A man often plants trees while gardening on the land of affines or matrilateral kin and these trees are inherited by the planter's son.

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[1] These claims were not thoroughly investigated but their accuracy was checked on a number of sample parcels where householders claimed a specific number of trees of various kinds.

7: Himaldi et al. E,I-5 (1962-1963) 1966 GJ23 Orokaiva GJ23
Mountain Orokaiva
Sivepe

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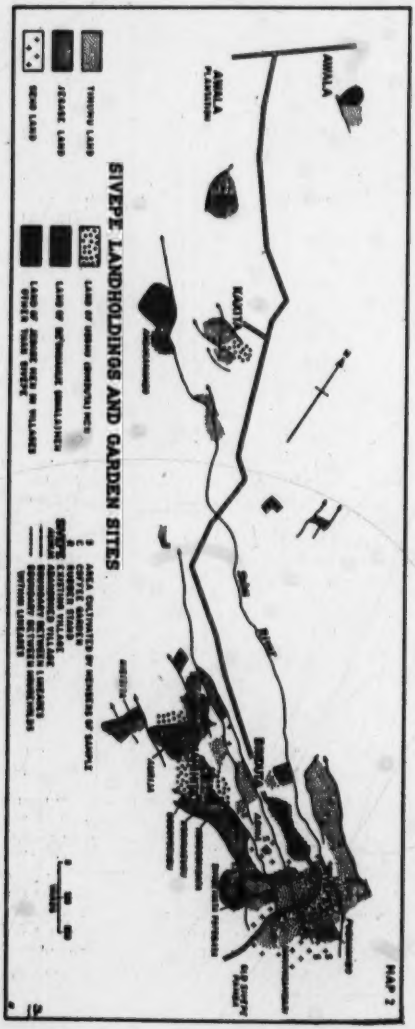

8: Waddell & Krinks E-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

Chapter 1

The physical and social setting

This chapter summarises the physical and social background to current attitudes to cash cropping among the Orokaiva. 128

The physical environment

(a) Landforms (see Map 1)

Lying between the main New Guinea cordillera and the Pacific Ocean, the Popondetta Sub-district[1] has a great variety of landforms and soils and, to a lesser extent, of vegetation.[2] Bounded on the south-west by the foothills of the Owen Stanley Range (4,000 ft) and on the south by Mt Lamington[3] and the Hydrographers Range (4,000 to 5,000 ft), the area comprises a broad plain sloping gently north-eastwards to the Pacific Ocean. Three elements may be distinguished within it: strongly dissected piedmont terraces, alluvial plains of volcanic materials (to the north-east of Mt Lamington) and flood plains from 10 to 25 miles wide extending from the terraces to the coast. All characteristically support primary or regrowth lowland forest except in the relatively drier and sandy areas, particularly on the plains north-east of Mt Lamington, where there are extensive stretches of grassland. 131 133 133 [137]

The CSIRO (Division of Land Research) considers (1964:17) that although there is more poor than good land in this area, 'some of the best land in the Territory' occurs on the gentle northern foot slopes of Mt Lamington and in parts of the flood plains where fertile volcanic soils and stratified sediments with a high organic content have developed. The major factors limiting land use are steepness of slopes in the mountain zone, and poor drainage and flooding in the lowlands. Soil deficiencies do not appear to be a serious limiting factor. 311 133

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1 An area of 3,712 square miles.

2 The following description is derived from CSIRO 1964:10-15.

3 A volcano which last erupted in 1951, resulting in extensive destruction and loss of life.

8: Waddell & Krinks E-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

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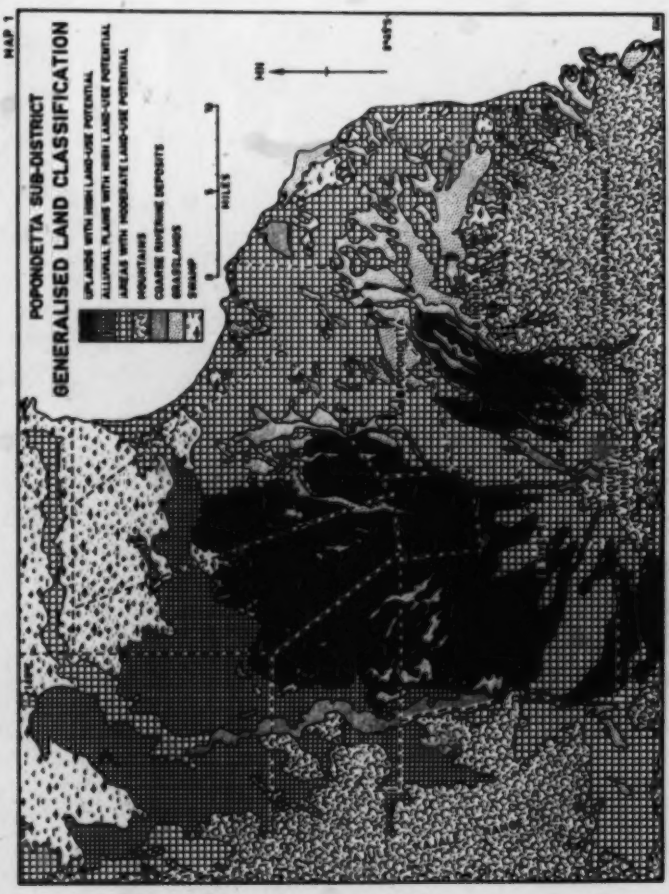

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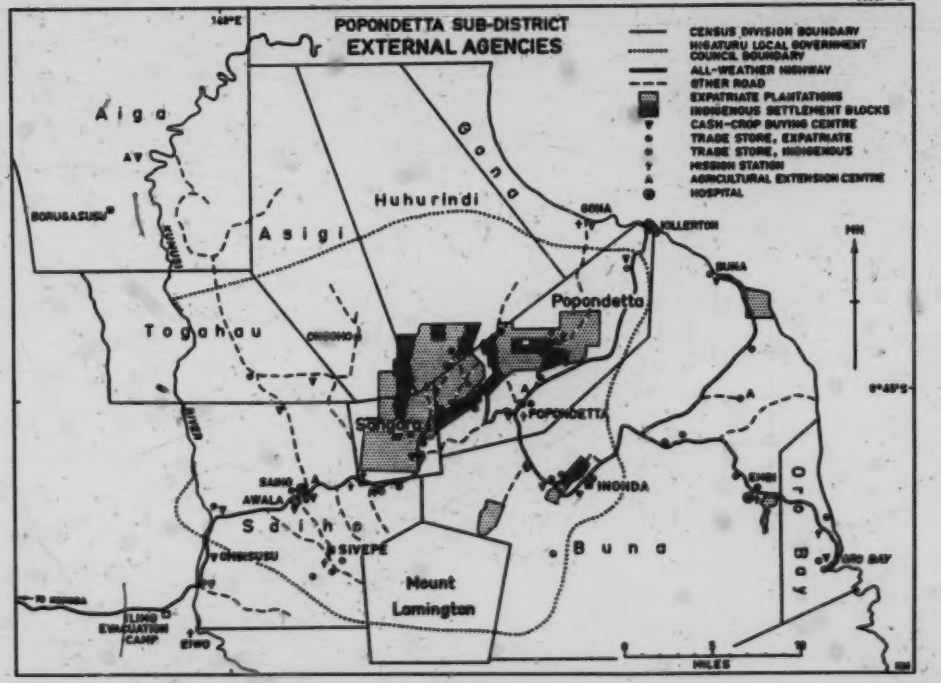
MAP 2



8: Waddell & Krinks E-4,5 (1964-1965) 1968 0023 Orobaiva 0023

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S: Waddell & Krinks E-4,5 (1964-1965) 1968 0723 Orokaiva 0723

Chapter 4

The two communities: Sivepe and Inonda

184 The villages of Sivepe and Inonda represent the extremes of population density, and therefore land availability, in the sub-district. There are significant differences between them in resources and in the degree and character of their participation in the monetary economy and their interactions with the principal external agencies.

Sivepe

133 Sivepe is situated 1,300 feet above sea level on the lower north-
[134] western slopes of Mt Lamington. Its land is classified by the CSIRO survey (1964:32) as belonging to the Awala Land System and is
137 characterised by fertile loam topsoils and a close-textured drainage system. The vegetation comprises predominantly secondary forest and various stages of regrowth, with little grassland. The land-
311 use potential is regarded as high and the fertile, well-drained soils are best suited for perennial (tree) crops.

301 The village is located in the most densely settled part of the sub-district, the Saiho census division, and there are eighteen villages within a radius of three miles (see Map 3). It has been
[131] on its present site for about ten years, but preparation of a new site, less than one mile away, was commenced late in 1964. Sivepe is twenty-eight miles from Popondetta by road, the last three miles being a little-used jeep track linking Awala with the villages on the lower slopes of Mt Lamington. Consequently, coffee and rubber have to be carried to Awala (or nearby Saiho) to be sold and purchases are normally made in the trade stores there. At Awala are a European rubber plantation, a rubber factory which purchases village latex and a well-stocked trade store. At Saiho are two trade stores, the principal Administration hospital for the Northern District (where medical orderlies and infant welfare nurses are trained) and a primary 'T' school. In mid-1964 a daily bus service was established between Saiho and Popondetta.

491 Also in mid-1964, several villages voluntarily commenced the
[499] construction of a new all-weather road, linking Sasembata mission

[TEXT CONTINUED ON PAGE 37]

8: Waddell & Krinks B-4,5 (1964-1965) 1968 QJ23 Orokaiva QJ23

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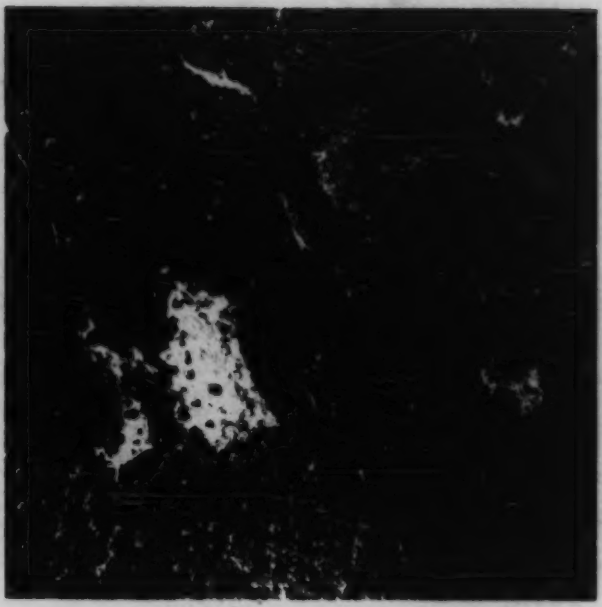
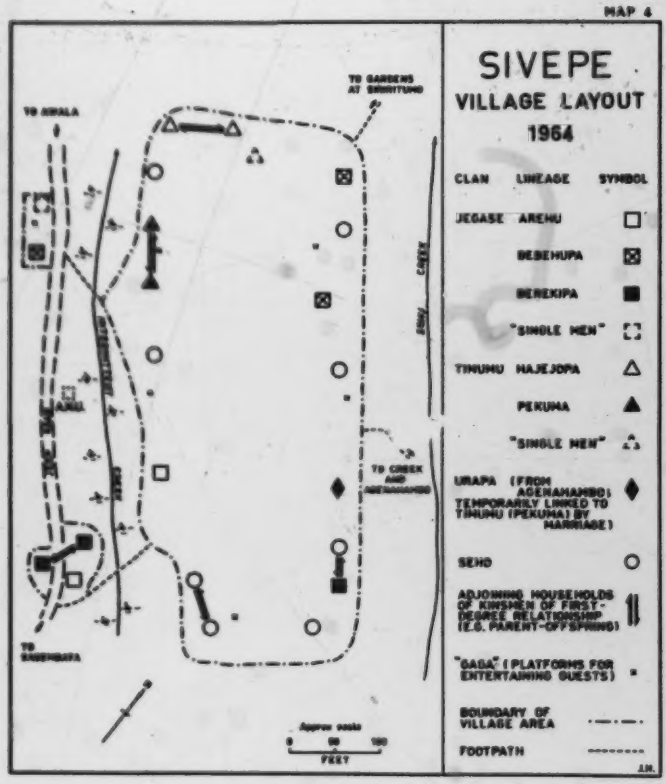


Plate 1. Sivepe - a 'line' village located in a forest clearing adjacent to the Sohu river and a minor vehicular road linking Sasembata and Awala. (Vertical photograph, scale 1:2,200.)

B: Waddell & Krinks B-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

MAP 4



8: Waddell & Krinks E-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

Only one man owns a mosquito net and there is only one transistor radio in the village. Some of the older people still wear tapa cloths but new ones are seldom made now. The more common form of dress is a pair of shorts, a skirt or a laplap, the skirts being mostly sewn at mothers' union sewing classes run by the Anglican mission at Sasembata.

Two men in the sample own shotguns, costing $58.75 and $59.75. These are the only items in the village representing large capital outlays and several other men had made contributions of $2 and $6 towards their purchase, so they can borrow them in return.

None of the houses conforms to the traditional Orokaiva style, but all are built wholly of local materials. They contain no raised platforms for sleeping, no shelves for food storage, and no cooking facilities other than an open fire. One man has built a 'kitchen extension' to his house while several other households cook primarily in shelters outside. Also, one man has built a simple table and bench outside and some members of the household occasionally eat at this.

A creek running beside the village provides the water for bathing, cooking, laundering, washing dishes and pulping coffee. Paths are narrow and unimproved despite constant use so that they become difficult to negotiate in wet weather. Not all households have pit latrines and those that do only use them irregularly. Small children often defecate on the village surrounds and standing water in various parts is a further health hazard.

Inonda

Inonda lands run from the low plains (200 feet above sea level), beside the Sambogo and Girua rivers, into the foothills of the Hydrographers Range. They include a variety of landforms, soils and vegetation - one-third of the village lands are covered with soils of the Popondetta family, which are well-drained sandy loam volcanic soils, supporting grasslands of Saccharum spontaneum-Imperata cylindrica alliance; one-fifth consists of coarse-textured riverine deposits which are moist, apparently fertile and support forest and regrowth. These are preferred for food gardens, although gardens are also made on the lower valley slopes of the Hydrographers, where the soils consist of well-drained clay loams covered with dense forest or secondary growth. The soils of the foothills are shallow and stony, supporting lower montane rainforest and, as with the grasslands, this area is used only for hunting and foraging. The CSIRO survey classifies most of the Inonda lands as having moderate land-use potential.

8: Waddell & Krinks E-4,5 (1964-1965) 1968 OJ23 Orokaiva OJ23

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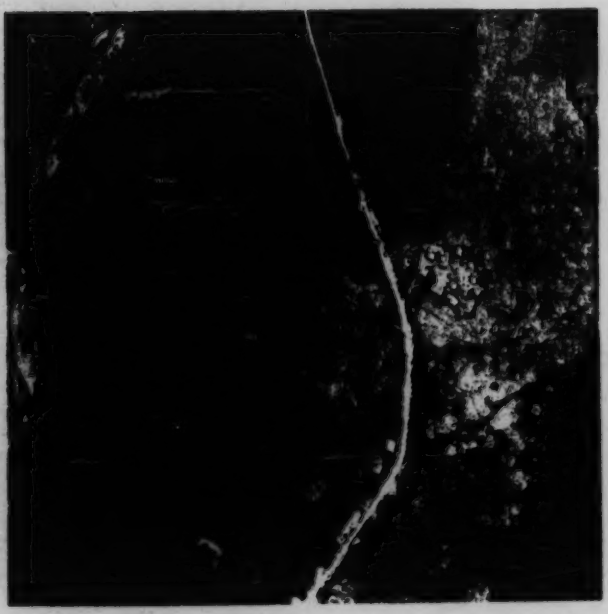

Plate 2. Inonda - the new village situated close to the grassland/forest boundary. The main Popondetta-Oro Bay road runs between the village and the Girua river.
(Vertical photograph, scale 1:4,200.)

361 Inonda lies in Buna census division, the most sparsely settled part of the Popondetta sub-district (with the exception of Buhurundi). Apart from an ex-servicemen's settlement block, there are only four villages within a three mile radius of both village sites (see Map 5). At the beginning of the survey, Inonda was on a site it had occupied since 1956, but during 1964 it was rebuilt about a mile to the south-west, still on the forest-grassland border.

491 [368] [131] The village is about ten miles from Popondetta, to which it is linked by a good all-weather road. About three miles towards Popondetta, west of the Girua River, is Hohota village and its off-shoot settlement, Ijika, where there is a local government council aid post, a church and attached primary school (with classes to standard III), and a trade store. Running north-east from the main road parallel to the Girua River is a line of ex-servicemen's settlement blocks - one expatriate - and eleven Papuan-owned, one of them [366] by a former resident of Inonda and several others from nearby [368] villages. There are five trade stores on or near the blocks, two [133] of them expatriate-owned, and a new Administration school. This [506] latter is not used by the Inonda people, although they believe it [494] to be a higher standard than the mission school. Eastwards from Inonda, the road runs through sparsely-populated grass plains to the coast at Oro Bay. Late in 1964 the Popondetta airstrip was closed and a wartime tarmac strip two miles east of the village was reopened to serve the township, with a consequent increase in traffic along the main road.

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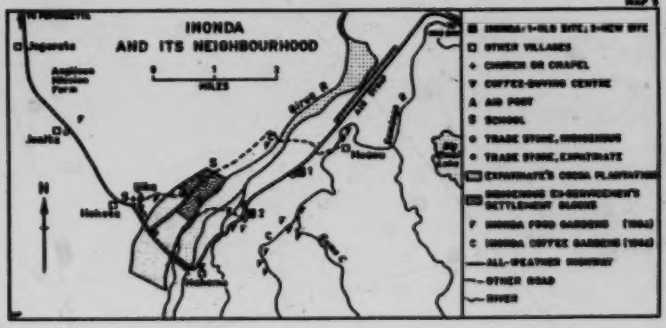
MAP 5



B: Waddell & Krinks E-4,5 (1964-1965) 1968 QJ23 Orokaiva QJ23

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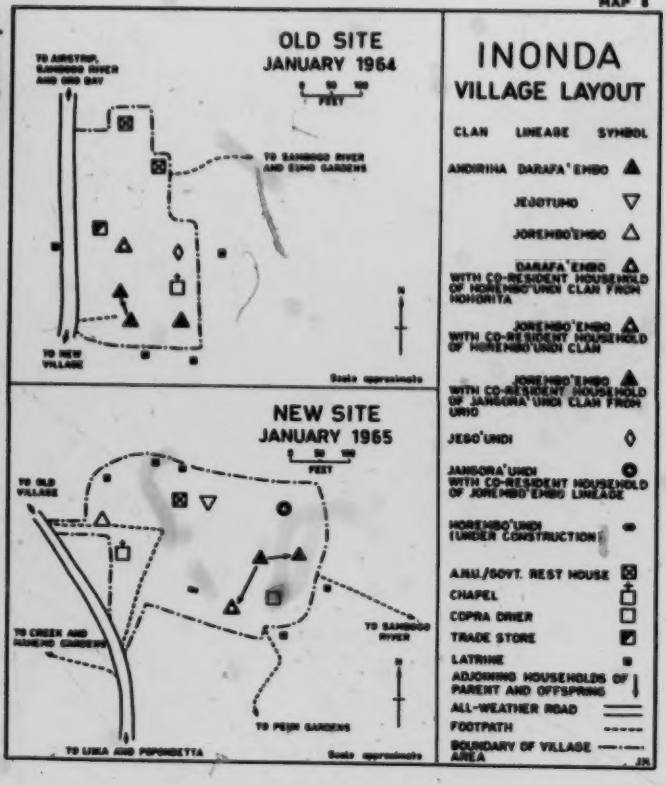
MAP 8



Patterns of activity and seasonal influences

An average of 43.5 hours per man-week are spent on all activities.[1] However, the general level of activity and distribution of time varies widely from week to week and also, in some cases, seasonally (see Table 7:3 and Figures 7:2 and 7:3).

(a) The subsistence sector

(1) Food production. Subsistence gardening is the most important category of activity, accounting for an average of almost 12 hours per man-week. Over half of this time is devoted to taro cultivation, except during the dry season when planting and, in particular, harvesting of taro are reduced, although maintenance increases. Over the year as a whole, the time spent on taro is almost equally divided between planting, weeding and harvesting. For the other crops, however, little time is spent on weeding and most attention is given to harvesting. This is true of sweet potato and yam, which are usually grown in specialised gardens, as well as of minor crops such as corn, cassava and banana which are usually interplanted with taro. Yams are planted late in the year and harvested in the dry season. Sweet potato is planted both in the dry and early in the wet season, the latter being the main harvesting period, before taro is in full production. Over one-fifth of the 2.1 hours per week spent on minor crops involves coconuts, another fifth bananas and 18 per cent sugar-cane. Eleven per cent is devoted to pitpit but this crop accounts for one-quarter of the total during the wet season. Cultivation of plants that provide edible leaves (ins) accounts for 9 per cent of the time spent on minor crops over the survey, but 29 per cent in the dry season. Corn and pumpkin account for about 5 per cent each.

Clearing of gardens takes place throughout the year, most in dry spells at the onset of the wet season when newly planted crops will benefit from the rain. In February and March 1964, during the wet season, there was an unusually high rate of clearing after a flood in January destroyed several gardens containing maturing crops. During period II (the dry season), the rate of clearing was comparatively slow, partly because the season was abnormally wet and partly because of the large amount of time invested in fencing, which is necessary particularly at this time since feral pigs from more remote bush areas tend to invade the gardens for food. Clearly, the protection of growing crops has a higher priority than the establishment of new gardens.

During the dry season, food-producing activities other than gardening increase in importance, and sago-making is concentrated

[1] See, however, the adjustment for additional data, pp.136, 138.

[TEXT CONTINUED ON PAGE 133]

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[133]

then sweet potato and minor crops. After the Mt Lamington eruption, several rivers flooded and, with the exception of Mamoko's, all the Inonda people's yam gardens were destroyed. The supply of yams has gradually been increased from those surviving in his garden, but he and his sons are still the only people with large holdings. Mamoko spends a considerable amount of time assisting others in subsistence activities; in particular, he cleared and maintained a sweet potato garden on behalf of the widow and also helped her in fencing, in erecting a yam storage house and in constructing her house on the new village site. He also spent 30 hours helping his son to make sago. His eldest son's wife and the widow often harvest in his gardens and cook for him. Among his other food-producing activities he spends 2.5 hours a week on hunting, using a spear and accompanied by his son's dog; he usually gives the produce to his son's wife.

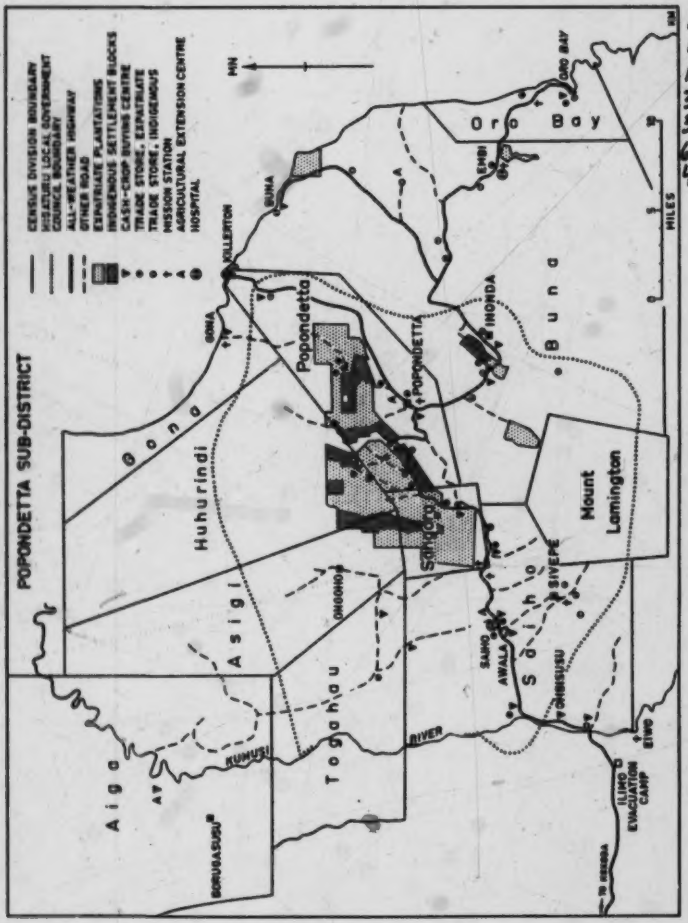
[224]

Mamoko was never absent from the village for a whole day, but spent 19 days inactive through sickness. Largely because of this, he was unable to attend a number of feasts and spent less time than anyone else in this way. Like most of the men, he spends little time on council work; this and other activities related to external agencies and the monetary sector account for only 4 per cent of his time. In other words, his activities are now almost wholly subsistence-oriented, although he maintains an interest in and encourages others to plant cash crops.

Embogi. A widow aged about 51, Embogi was born in Urio village and retains close links with her kin there. Her first and second husbands, who were brothers, belonged to a subordinate branch of the main lineage in Inonda. Her third husband, who had one other wife living, died in 1962. She has a son and a daughter from this last marriage, and has remained in Inonda partly to maintain her youngest son's rights to land inherited from his father. She maintains a separate household with these two children but in August her eldest son and his wife (Marjorie) moved in with her prior to building their own house on the new village site. Embogi's second son (by her second marriage) normally lives with her but for most of the survey was staying with a classificatory father while attending the administration school at the settlement block. Her house was built mostly by this son and Mamoko, the eldest son being absent at the time at his wife's father's funeral feast in Hoherita.

[166]

Although Embogi's working week is considerably longer than Mamoko's, it is shorter than that of most others. However, 80 per cent of her time is devoted to productive



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[p.44]

9: Kearney P-5 (1963) 1966 QJ23 Orokaiva QJ23

Table 1

The samples and agricultural systems

Village or group	Approximate population	Tribe	Type of terrain	Type of land tenure	Other research workers	Comments
Inonda	43	Sangara	inland plain	Higaturu Council scheme (low population density)	Crocombe and Hogbin	Supplemented by 10 from Hohota
Beporo (Gona)	500	Notu	coastal plain	Spontaneous resettlement	Dakeyne	
Sivepe	120	Sangara	inland hilly	Higaturu Council scheme (high population density)	Rimoldi	Supplemented by 3 from Pereko
Ex-service-men settlers	150	various	inland plain	Individual proprietorship (with government loans for development)	Cheetham	From Isevene, Sangara and Girua
Plantation labourers	?	various	-	European plantations	Howlett	From Awala, Kagana and Mayoh
Ongoho	55	Asigi	inland plain	Communal tenure of cash crop land	Crocombe	
Borugasusu	180	Aiga	riverine	Traditional tenure	Rimoldi	

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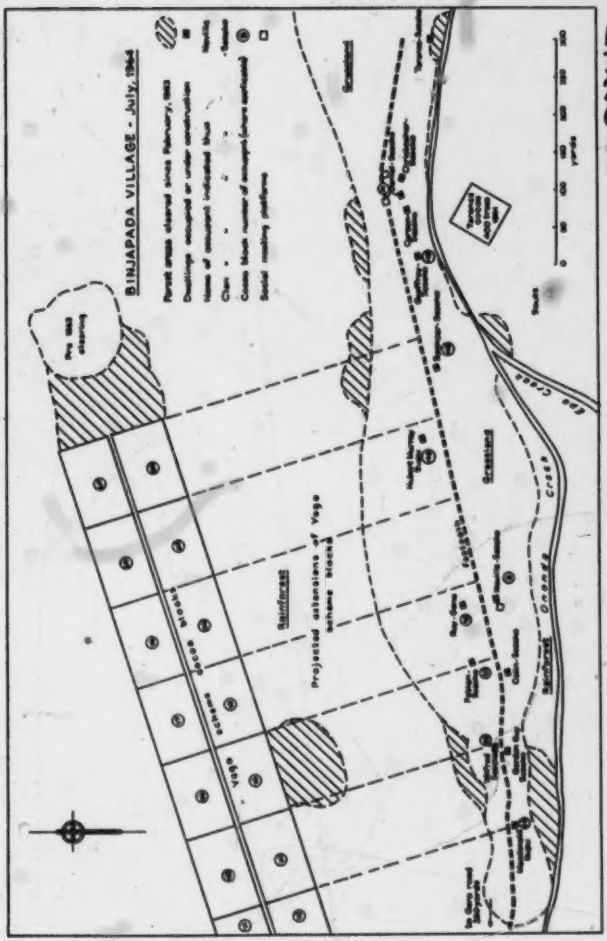

Figure 6

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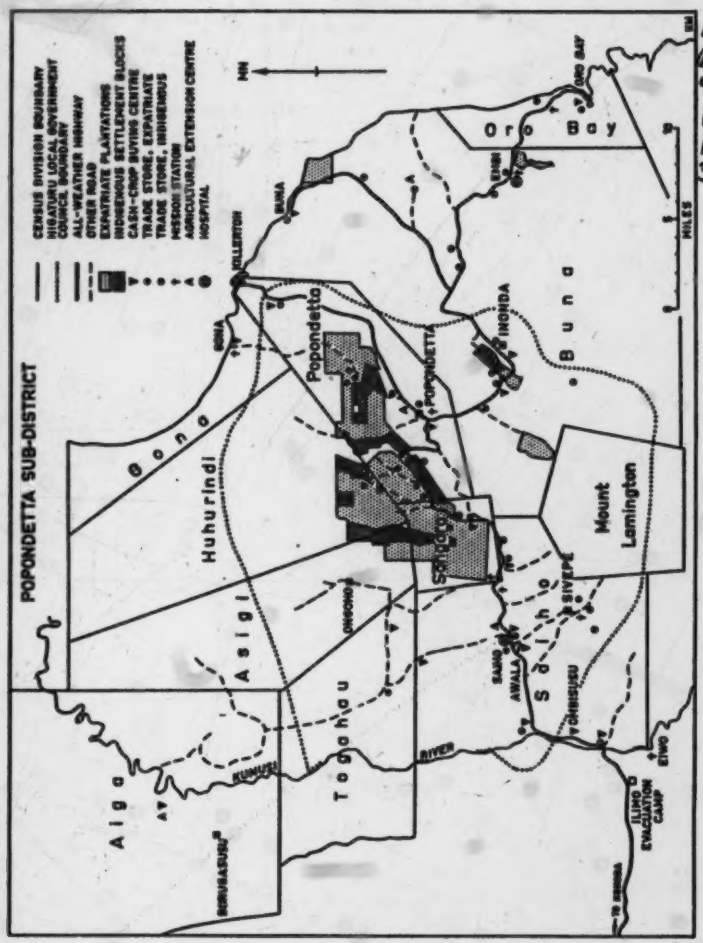
11: Dakeyne K-5 (1962-1964) 1966 QJ23 Orokaiva QJ23
Yega



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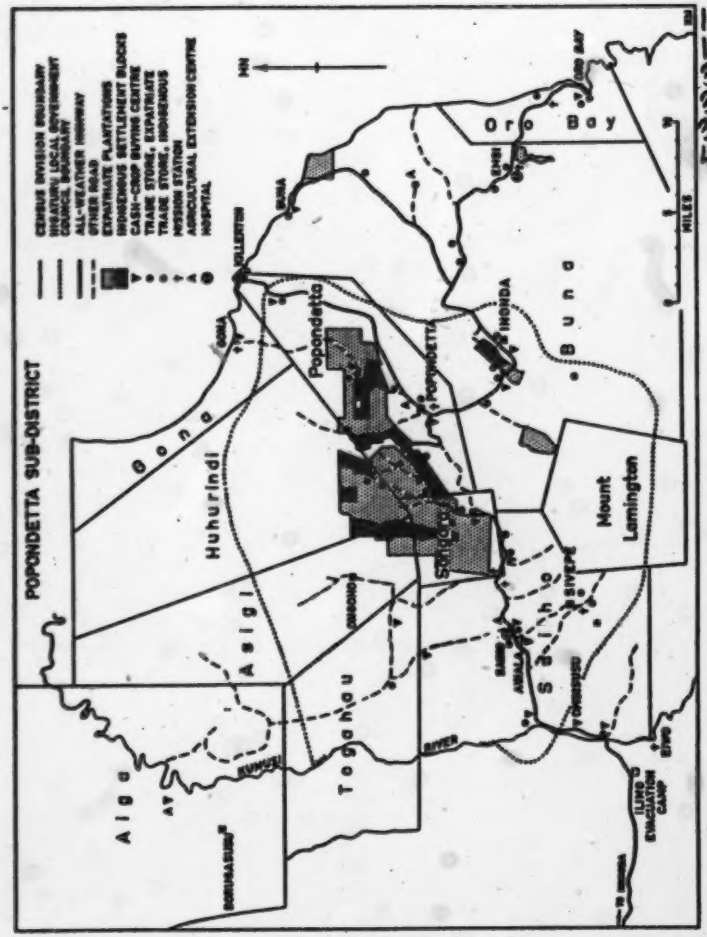
12: Crocombe E-5 (1962) 1966 OJ23 Orokaiva OJ23
Inonda



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[p.iii]

13: Hogbin E-5 (1962) 1966 QJ23 Orokaiva QJ23
Inonda

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CHAPTER 1 - INTRODUCTORY

Location and facilities

131 Inonda is situated about eleven miles from Popondetta on the Oro Bay road. Up to the present access to Popondetta has been dependent on the state of the Girua river but with the completion of a bridge later this year all-weather access will be ensured. Inonda lies within the Orokaiva culture area and is served by the Higaturu Local Government Council. Administration patrols visit the village once or twice annually.

368 [811] [787] The nearest school is about six miles away across the river at Hohota. Some children attend this school spasmodically and a few board at church schools at Popondetta or Embi. Others do not go to school at all. There is an Anglican church in the village though it is little used except when an itinerant priest happens to be passing by.

498 [366] 499 Kerosene, tobacco, sugar, salt and other household requirements are usually purchased from a small trade store about three miles distant but larger purchases are made in Popondetta. There are four main items of traditional trade which appear to follow particular routes. As betel nuts do not grow well in Inonda these are bartered or purchased from inland tribes (usually through relatives) and the lime which is chewed with them is acquired from the coast. Traditional valuables (hambo) are acquired most frequently by barter with the coastal people, but birds' feathers for making head-dresses (di) are obtained from the Managalas tribes in the mountains in exchange for dogs, money and other items. The advent of shotguns has reduced the trade in feathers to those of birds of paradise and other relatively rare species. In bygone days clay pots and wooden bowls were traded from the coast in return for feathers and other valuables but with the advent of cheap imported utensils this trade has ceased.

Physical features

133 Topography: The Inonda lands lie partly on the flood plains of the Girua and Sambogo rivers and partly in the

133 moderately sloping foothills of the northern side of the extinct strato-volcanic Hydrographers Range. The Sambogo and Girua rivers flow in a ~~northerly~~ direction draining from the Hydrographers Range and Mt. Lamington respectively. They are swiftly flowing, rocky-bedded rivers which, together with their numerous tributaries, give the area a moderate to good drainage system. To the east the drainage system in the vicinity of the Embi lakes has been blocked by recent volcanic activity and drainage is much poorer. A vast coastal plain between twenty and thirty miles wide stretches north-westwards from the Hydrographers for over sixty miles. Inonda lies at the southern end of this plain, about fifteen miles inland from the coast.

134 Soils and vegetation: The Inonda lands are classified below on the basis of the soil associations set out in the Interim Report of the C.S.I.R.O. survey of the Kumusi River-Oro Bay area.(1)

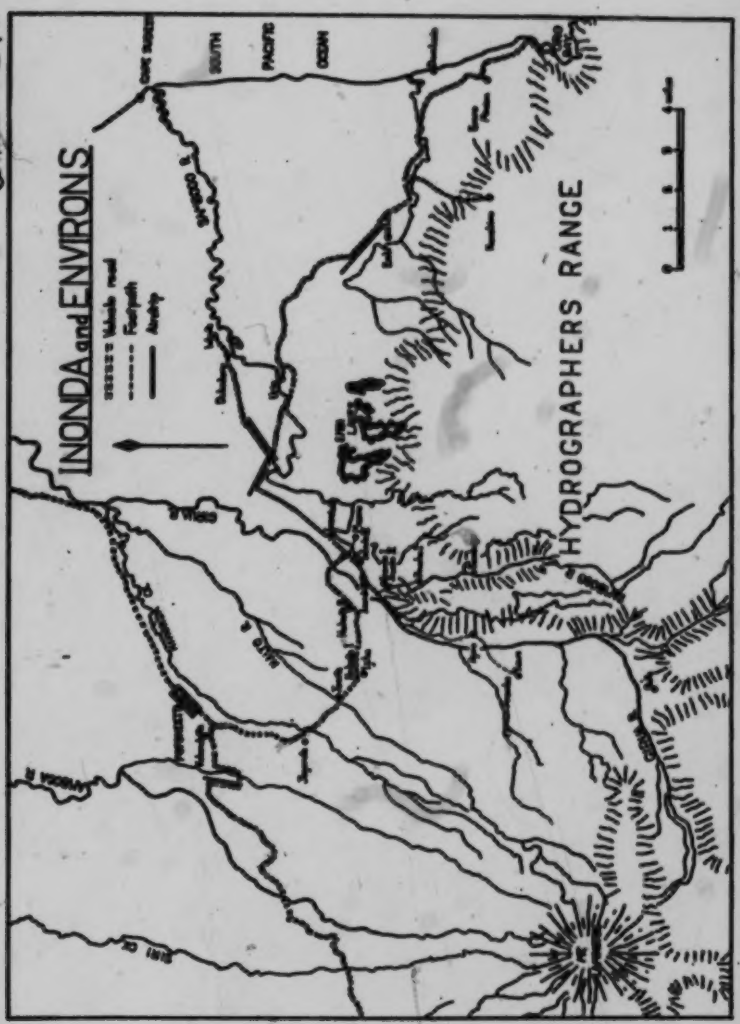
[135] (i) The Popondetta Association covers approximately one third of the Inonda lands. Its soils characteristically have a black to very dark brown topsoil underlain by a yellowish grey volcanic sand subsoil and are usually moderately well drained. They are covered with kunai grass (predominantly Imperata sp.) or savannah and are not used by the people for food gardens because of the difficulty of freeing the ground from grass roots. Because the land is flat there may be some potential for mechanized farming on soils of the Popondetta Association, provided that their natural moderate fertility can be improved or at least maintained under cultivation.(2)

Associated with these soils are small areas of fine textured, recent, alluvial soils, usually covered with forest or

(1) C.S.I.R.O. (Land Research and Regional Survey Section) Interim Report on the Description and Assessment of the Land Systems and Soil Associations in the Kumusi River-Oro Bay Area, Northern Division, Papua. (Unpublished Record) 54/2. June, 1954.

(2) There is still some doubt as to the suitability of this soil for mechanized agriculture as there is a tendency for the soil structure to disintegrate under intensive cultivation.

14: Crocombe & Hogbin E-5 (no date) 1963 QJ23 Orokaiva QJ23 Inonda



14: Crocombe & Hogbin E-S (no date) 1963 QJ23 Orokaiva QJ23
Inonda

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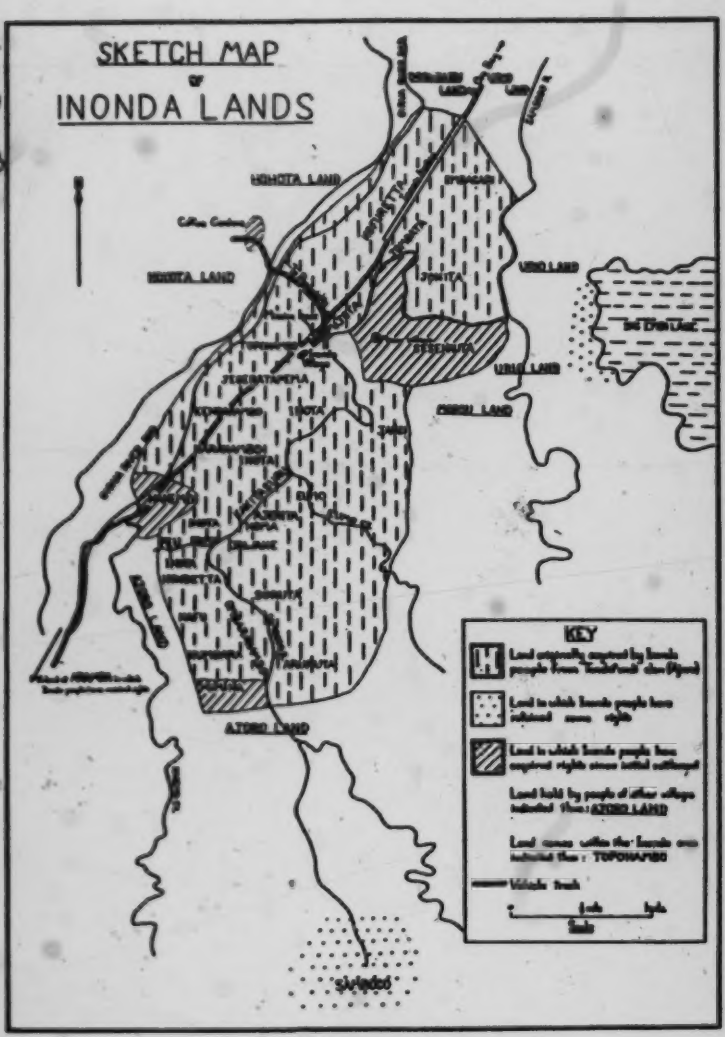

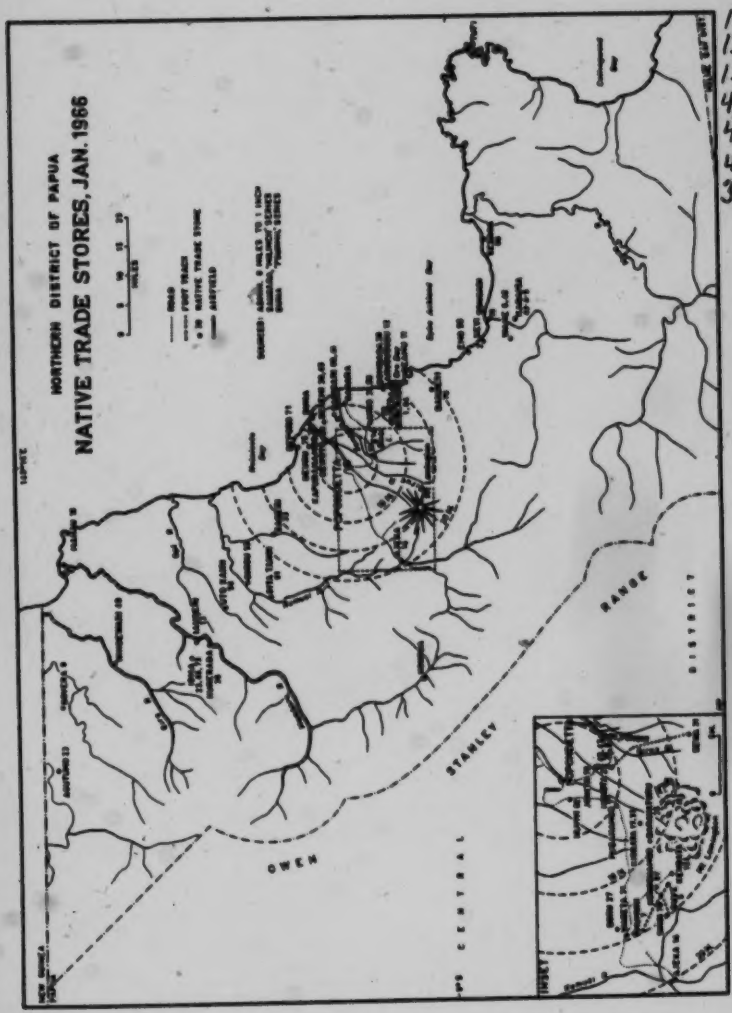

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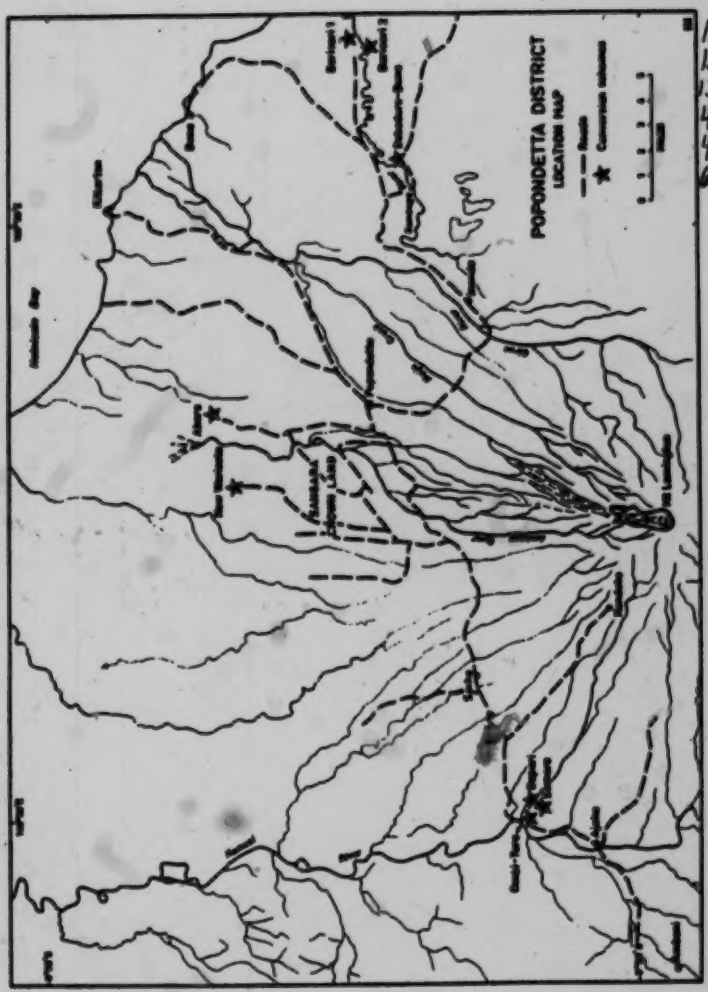
17: Morawetz U-4,5 (1966) 1967 QJ23 Orokaiva QJ23
Ombi-Tara



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Appendix B

The Ombi-Tara environment and population

131 Ombi village is in the Kokoda sub-district about twenty-seven
[133] miles from Popondetta along the main Popondetta-Kokoda road. It is situated on top of a plateau up a steep escarpment, about 250 yards from the main road. Tara is about two miles from Ombi and straddles the access road which runs through the converted land occupying part of two of the blocks. It was previously about two miles further away and was moved to its present site in 1964 after survey of the land to be converted was under way.

133 The Kumusi River flows close to the Popondetta-Kokoda road,
[361] about four hundred yards from Ombi village. Ombi village was formerly sited next to the river but was moved to its present higher location in about 1957, reportedly to escape the mosquitoes.

871 The nearest school is conducted by the Administration at Ajeka,
872 about two miles away. Most children of the appropriate age attend
[369] school daily. Several of the older children board at schools in Popondetta while some children do not attend school at all.

366 The nearest trade store is at Ajeka but this is seldom open,
438 and most purchases are made from the store operated by a European
439 planter at Awala, a distance of seven miles. Clothing and larger items are purchased in Popondetta.

134 The Ombi-Tara lands are part of the Higatura land system which contains a considerable proportion of good land with reasonably fertile soils, suitable for many arable or tree crops as well as pasture.[1]

132 The most important features of the climate are the generally
137 heavy rainfall, and the almost uniformly high temperatures and humidities throughout the year. Rainfall ranges from 120 to 150 inches annually and may well be greater in the higher areas, including Ombi-Tara. These climatic features are reflected in abundant plant growth. At Ombi-Tara rainforest covers much of the surrounding land, which is marked by a series of steep ridges.

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[1] See C.S.I.R.O. 1964.

18: Dakeyne K-5 (1962-1964) 1969
OJ23 Orokaiva OJ23
Yega

changes in rural areas. For a man to leave his village and go to work in the town means long separation from his family and from his kin, an experience unheard of in the past. Separation from his relatives means that he may be facing dangerous risks from the sorcery of foreigners in an unknown country. This is one reason why migrant workers tend to live in kin clusters in the towns. Unemployment, inadequate living quarters, low wages, the necessity for paying in cash for all goods and services, and the obligation to send cash gifts to relatives in the villages, all add to the town dwellers' difficulties.

The three areas to be studied in this book are:

1. The north coast of Papua, near Popondetta, inhabited by the Yega people.
2. Central Bougainville, near Kieta, inhabited by the Nasioi people.
3. Port Moresby — two indigenous communities.

These three areas have been selected because they are all experiencing rapid change. Moreover, they are areas of actual or potentially great economic development. The stresses and strains put on the traditional way of life in such circumstances are particularly severe; study of such situations may help to give students a deeper appreciation of the problems faced by the people of New Guinea today.

Northern Papua and Central Bougainville are rural areas where the inhabitants have a primarily subsistence economy basically similar to that of their traditional culture, but modified by the innovations introduced by Europeans and latterly by their own educated younger members. There are, however, important differences which are summarised below.

Topography. Northern Papua is a gently-sloping, almost featureless plain, covered by rain forest interspersed with grassland, traversed by a few braided streams and many small creeks. Central Bougainville is mountainous with peaks up to 7,000 feet above sea level. Steep, tree-covered slopes, rocky outcrops, and rushing streams which rise rapidly after rain are typical features.

Social. The social structure of the Yega is localised patrilineal clans, sub-clans, and lineages, inhabiting a few square miles of land.

[P.3-B]

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Fig. 4. Yega territory, Bepare Village and school in foreground. Light gray patches are grassland; patches of mature rain forest can be easily distinguished from the lower secondary growth

[P.8-A]

439 buy cheap cloth and durable iron or
178 aluminium pots at the trade stores. Although
every housewife now has two or three large
415 manufactured pots, she keeps them for cook-
252 ing the food for feasts. Most of the daily meals
[429] are still prepared in clay pots but few of these
[431] pots were obtained by the old barter methods;
most were obtained as gifts from friends or
relatives. At one wedding, for example, the
585 bride received fourteen clay cooking pots, in
431 addition to a large supply of mats, string bags,
enamel plates, and dishes: enough to last for
years to come.

ECONOMIC CHANGE AND THE PATTERN OF SETTLEMENT

178 A very close relationship exists between
361 economic change, particularly the planting of
cash crops, and changes in the pattern of
settlement. Although most development has
[173] occurred in the last twenty years, there is evi-
dence, supported by the oral traditions of Yega
elders, to show that some evolution of settle-
ment had occurred even before the first con-
173 tact with white men. By tradition the Yega
361 were sea people. This probably means that
they arrived as migrants and originally spent
most of their time aboard their canoes and
lived mainly upon seafood. They settled first on
three small islands, Baroda Deuga, about half
a mile north-east of Waususu Point (Fig. 9).
[133] These islands are today only a few feet above
high tide and are composed entirely of coarse

[P·12-A]

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[133] coral sand and lumps of dead coral. Although there are mangrove trees on the islands, there would be no possibility of growing food crops there. At some time well before the arrival of white men, the Yega moved from Baroda Deuga and founded a large village, Basabuga, on the eastern shore of Waususu Point. In Basabuga each clan was allocated a specific [614] area in which family heads built their homes. Probably there were only three original clans, but these were joined at intervals by the ancestors of the other five clans who now make up the Yega parish. Basabuga is in an ideal defensive site, protected on the landward side by mangrove swamps to the south-east, and on the south-western side by swamp filled depressions running parallel to the beach. The sea provided an escape route to the north.

361 By about 1910 when the first school was
[871] begun at Waususu Point, some clans had moved eastward or westward and settled in other coastal villages. In each village the male
361 members of a clan lived together with their
614 wives and children, and although there was a good deal of inter-clan contact, the clan village was the main social unit. The main reason for the dispersal of clans from Basabuga was probably population pressure but the enforced cessation of inter-parish warfare un-
361 doubtedly contributed. The movement westward along the beach continued until about 1930. People were encouraged to move by the
[659] increasing effectiveness of Government control
[799] and by the establishment at Gona Mission of a school and hospital staffed by Europeans.

[P.12-B]

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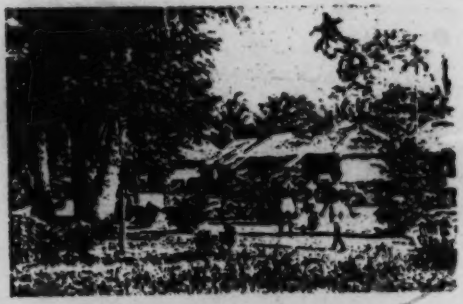

Fig. 10. *Scene in Sapora village. In left foreground are coconut palms. The tall slender palms behind the houses produce areca nuts, one of the ingredients of betelnut*

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Fig. 11. *The new village of Oreeda under construction near the cocoa blocks five miles from the coast. (Picture taken in January 1962.)*

[P. 13-B]

PREFACE

121 The following report presents data designed to be used in "A Comparative Study of Cultural Change and Stability in Displaced Communities," a project directed by H. G. Barnett. The report follows closely a list of topics specified as variables in the study. In a preliminary statement on the project, Professor Barnett (n.d.) states the reasons why the Orokaiva, living on the [731] slopes of Mount Lamington, were included in the project. In 1951, Mount Lamington erupted, some 4,000 people were killed, and the survivors were resettled under close governmental supervision. This resettlement, as a consequence of a natural disaster, makes the Orokaiva case comparable to the other 11 cases included in Professor Barnett's study. The focus of our attention must therefore be the social and other cultural consequences of this government-sponsored resettlement.

731 I should at once note certain differences between this 101 Orokaiva case and most of the others included in the study. Mount Lamington forms the centre of a rather populous district which is [133] segmented into very small units socially and politically, but which forms a definite unity in cultural respects. (See Map I.) [361] Differences in language, social structure, political and economic organization and material culture, in a wide area North of Mount Lamington, and included in the Popondetta, Sohe Popondetta and Saiho divisions of the Northern District, are so small as to be almost insignificant. Only one of the refugee camps established immediately after the eruption was outside this culture area, and its occupants were shifted back to the Orokaiva district within a few weeks. From that point onwards, people were no longer separated from their culture but only from their land. As resettlement proceeded, even separation from traditional land holdings was soon terminated, so that the typical "resettled" village, though in a different spot from the pre-eruption village, still had access to the same land holdings.

121 In these circumstances, many of the traumatic experiences 731 which are the subject of the other case studies in this project are not replicated in the Orokaiva case. There is no question, however, about the serious social consequences both of the eruption and of the large-scale government intervention that followed. To trace these consequences at the present time is no easy task. As all the Orokaiva returned to their own land a number of years ago, a great part of this report is an historical reconstruction and the Orokaiva are neither devoted nor accurate historians. Most happenings are covered over in their memory just as the jungle rapidly covers over past cultivations and past settlements. Some songs, some myths, and the harrowing personal experiences remain.

823 collection of vernacular texts written by a young man from Kiorota
773 in 1952 (White, n.d.).

According to all versions, a man named Sumbiri and his wife Suja went hunting on the Mountain. They stayed there for several weeks, while the husband caught wallaby and cuscus and found some birds' eggs. In three of the versions, the Mountain began to rise while Sumbiri (ignoring a taboo) slept with his wife. Several crags then formed on one of which the couple was lodged, unable to climb down. Separated from the world, they leapt into the crater that had formed between the crags. The fourth version, collected at Hohorita and belonging to the Sangara tribe, describes a fight between a pig (presumably the first pig ever hunted by man) and a large dog or dogs, during which the mountain began to change shape. Originally it was "one Mountain but now it became divided into parts so that there remained a number of peaks too steep to climb up or down." Pig and dog(s) disappeared into the hole that was formed; the man and woman found themselves separated on different crags and died of loneliness and despair. The mountain is called Sumbiripa Kanekari, "The Separation of Sumbiripa." This Sangara version is notably the richest in mythological content.

[174] Is it possible that these versions all originated after the eruption? Though it cannot be ruled out, it seems unlikely. One of them was written down by a student mission teacher as early as 1952; the Sivepa version recorded by me presents the mythical event and the eruption of 1951 as two distinct successive events. None of the events that most deeply impressed people about the eruption of 1951 (explosion, flame, darkness, wind, deaths) are incorporated at all in any of the versions. It seems more likely that the myth refers to an event remote in time and not remembered more clearly than most modern Europeans are aware of the factual basis of the Book of Genesis. Nonetheless, the myth points to an earlier structural change in the Mountain, caused by volcanic activity, and sufficiently recent to have left some impact on human memory.

Section 2: Preliminaries of the Eruption

133 For some time prior to the eruption, Mount Lamington behaved
731 rather unusually. Orokaiva and Europeans each gave their own explanations for this unusual behaviour. The Europeans, being politically more powerful, were able to impose their plan on the Orokaiva. The Europeans felt no qualms in doing so, as they regarded their own views to be scientifically based, whereas the Orokaiva view was based on the presumed anger of Sumbiripa. As we shall see, this was a case where bad science was more dangerous than sound superstition.

133 Just when these preliminaries started is not clear; it may have been one week before the disaster or several weeks. The rumbling and tremors in the mountain, which were usual enough, became more severe; smoke was beginning to come out of the crater in thick puffs high into the sky; the number of craters rose from one to four or five. Ash covered the peaks, areas along the slopes became burnt; sometimes there were flashes of fire; several landslides appeared as brown streaks in the forest. Swarm-pattern earthquakes became widely felt throughout the area. On Thursday, 18 January 1951, the more active phase of the eruption began (Taylor, 1958). The emission rate increased throughout the day; the smoke gushing forth "at a great rate" varied from black to grey and spasms were noted in the crater activity. The emission was described by more distant observers as a slow-moving continuous dark-grey column ascending to many thousands of feet. A survivor who looked at the mountain through a telescope on that day noticed that a large hill had built itself up between the hills at the foot of Lamington and the mountain at the rear. That night, the mountain was shooting fire like an immense fire works. In the Sivepe area, at this time, and on Friday, stones were falling on the gardens, earthquakes were very severe and some houses had collapsed.

731 The Orokaiva interpretation of these events will be clear from what I have already written. It is explicitly supplied by Benson (1955) who reported that the fearsome happenings in the mountain were ascribed to the anger of Sumbiripa. I shall show later that the same view was taken in Sivepe. The clearest description [114] of the state of mind of the people close to the mountain (those who were mostly to become the victims of the blast a few days later) was given in a letter by Margaret de Bibra, head teacher at Martyr's School in the Sangara Anglican Mission. Miss de Bibra died during the eruption but her letter was found after her death (White, n.d.).

> The Papuans--well, most are calm, many are apprehensive and some really frightened, especially those whose villages are near the mount. It is all understandable, in fact it is to their credit that there is no panic. Lamington has not been a volcano within the memory of living man, nor in the legend of the [813] people. (But see above, E. S.) True, Lamington is feared as the home of spirits and no local man--even Christian--will venture to the top. As one of our Church Councillors said: 'The mountain people do not understand. They are afraid. We understand a little and we are afraid too. Our fathers did not know of it. The trembling of the earth--yes, but not

731 the fire. At night it is like a torch,
and we do not understand the sign.'

We cannot be entirely sure what the mountain people would have done had they not been under European influence. Informants at Hohorita told me that the people wished to run away, but that the Europeans persuaded them to stay. It is likely that people seriously considered leaving the mountain during the few days before the eruption, but it is also likely that they feared the dangers and troubles that would have followed their departure. Where could they have gone? How could they have found food? Most important of all: would other clans occupy their land during their absence? The evidence shows that, in the circumstances, the mountain people contented themselves with statements of their apprehensions to European authorities and placed upon them the responsibility of deciding what should be done in this unusual and frightening predicament.

731 The two main power centres of the Orokaiva district at that
657 time were both very close to the mountain (see Map II).[A] The headquarters of the Northern District government administration was at Higaturu; Martyr's School and the main mission centre was at Sangara; both these places were subsequently destroyed by the blast and their residents killed. These were the foci of decision. Two of my informants were able to tell me something of what happened there: Fa. Albert McLaren, who was at Sangara until the day before the eruption and Mr. C. Searle who visited Higaturu on Friday, 19 January. Both told me of apprehensive Orokaiva asking European authorities what they should do.

The District Commissioner decided to discourage the people from leaving their home villages. He maintained throughout that there was no need to worry about the mountain. The circumstances that led him to this decision were described to me by Mr. Searle, by Mr. Paul Sebire, Assistant District Commissioner, Popondetta, in
● [133] 1966 and by other informants. There had been several earlier eruptions in the district, one at Tufi in 1943 and another at Rabaul in 1937. The District Commissioner at Higaturu, Mr. Cowley, was well informed about the former while the latter had been witnessed by the Chief Justice of the Territory, Mr. M. Philips. The District Commissioner asked the Chief Justice for an opinion and the latter overflew the mountain on Friday, 19 January, to assess the situation. The Chief Justice advised that evacuation of the station was unnecessary. On the assumption that Mount Lamington was like the other volcano which he had seen in eruption, The Chief Justice believed that Mount Lamington could not be very dangerous, seeing that emissions on such a large scale had already occurred. On that premise the pressure built up inside the mountain had already been reduced, and only relatively harmless cold ejecta could now be expected.

A [See Cat. 118, pp. End Map 2(A)-End Map 2(B)--Analyst]

Section 3: The Day of the Eruption

121 As the eruption itself is the central event of this entire
128 report, I shall dwell upon it in some detail. I shall discuss it from five vantage points: the vulcanologist's, the experience of the Sangara people, the Sivepe and the Inonda people, and finally
133 the action of the administration. The vulcanological aspects have been fully dealt with in G. A. M. Taylor's book, The 1951 Eruption
731 of Mount Lamington, Papua (1958). Taylor writes: "At 1040 hours on Sunday, 21 January, 1951, a paroxysmal explosion burst from the crater and produced a nuée ardente which completely devastated a surrounding area of 68 square miles." This explosion had a marked resemblance to that of Mount Pelée at St. Pierre on Martinique in 1902, when 29,000 people perished in a few minutes. The effect of the Pelean type of explosion is very different from the more usual one which is called "Vulcanian," and which occurred, for instance, at the famous eruption of Vesuvius described by Pliny. One may compare it, rather, with the effect of an atomic bomb; the lethal effect of the nuée ardente seemed to be due mainly to sudden damage to the respiratory system caused by inhaling hot dust. Almost 4,000 people were killed. Destruction in the inner zone of devastation was almost complete: the rain forest on the slopes was flattened and in some places the earth was swept bare, not even stumps remaining as evidence of the previous forest cover. At Higaturu, six miles from the crater, only one house remained reasonably intact; most of the buildings on the government station were carried away. Of the people who lived in this inner zone of devastation scarcely a single one remained alive.

Taylor classified a further 2? square miles as "partially devastated," "a thin heated strip which bordered the abrupt edge of the zone of complete destruction." The survivors who saved themselves by running away from the blast all came from villages in this marginal area. The line of demarcation was rather precise; everyone from the Sangara mission station was killed, and this station lay just inside the borderline of the area of complete devastation. The people of Isivita, just outside the border of partial destruction, were mostly saved. The people now inhabiting Hohorita came from villages such as Tunana, Sesuu, Sehundeturu, all of which lie in the area of partial devastation. From the village of Sombo, on the boundary of the area of complete devastation, one man escaped (Table 1).

731 I interviewed members of 15 Hohorita households about their
[124] experiences during the day of the eruption. Some of them escaped because they happened to have gone hunting, or were visiting their mother's relatives; one man who had gone to the Sangara church that morning was saved because he had gone home to Asbogo immediately
A [See Cat. 116, p. 205--Analyst]

133 Sivepe lies on an altitude of 1,300 feet, seven miles from
[361] Mount Lamington. Although the mountain rises to a height of 5,634
[241] feet, most present settlements are on the lower slopes, rarely very
[731] much higher than Sivepe. A wide range of annual and perennial
[361] crops, including taro, on which the Orokaiva depend, do not grow well at altitudes much above 1,500 feet. Thus, the eruption has had no appreciable permanent influence on the location of village sites. The restricted area is at present a circle of two miles' radius from the crater of Mount Lamington; there are not now, nor were there before the eruption, permanent settlements closer than four miles from the crater.

The Sivepe terrain (if I may borrow the terminology of the CSIRO report) is characterized by a gentle radial slope on wide planar ridges between the larger steep-sided streams flowing from Mount Lamington into the Kumusi River. Numerous smaller creeks, together with these streams, form an effective fine-textured radial drainage system. Drainage is facilitated, moreover, by the extreme porosity of the soil.

134 Sivepe (see Map III)[A] is on a soil association of the Awala land system which has an 8 to 12 inch very dark brown topsoil. Chemical tests suggest that these loams are fertile, rich in nitrogen and phosphorus. The fine-textured subsoils range from 10
[823] to 22 inches in depth. Rimoldi points out that this dominant soil type, which the Orokaiva call mune (a word whose principal meaning is night, darkness), is only one of five found in the district and distinguished by Orokaiva by colour, texture and moisture. The others are hohori (red), which is popular for cultivation if it is not sandy; gindiri (stony, with high sand fraction); pusu (clay) and pesara (swamp). Mune is the most widely used soil for gardens.

133 In contrast, Inonda (see Map IV)[B] is no more than 200 to 300 feet above sea level. It lies partly (to draw on the CSIRO report again) on the flood plains of the Girua and Sambogo rivers and partly in the moderately sloping foothills of the northern side of the extinct strato-volcanic Hydrographers Range. The Sambogo and Girua Rivers flow in a northerly direction draining from the Hydrographers Range and Mount Lamington respectively. They are swiftly flowing, rocky-bedded rivers which, together with their numerous tributaries, give the area a moderate to good drainage system. To the east the drainage system in the vicinity of the Embi Lakes has been blocked by recent volcanic activity and drainage is much poorer. A vast coastal plain between 20 and 30 miles wide stretches north-westwards from the Hydrographers for over 60 miles. Inonda lies at the southern end of this plain, about 15 miles inland from the coast.

134 Crocombe and Hogbin classify Inonda soils on the basis of five soil associations listed in the CSIRO survey: (i) the Popondetta Association, with black to very dark topsoil underlain by yellowish-grey volcanic sand subsoil. The topsoil looks like

A [See Cat. 116, p. End Map 3--Analyst]
B [See Cat. 116, p. End Map 4--Analyst]

Section 2: Physical Environment

131 The present territory of Hohorita stretches from near Mount
133 Lamington (an elevation about equal to that of Sivepa) down to Double
132 Crossing, which is about 600 feet above sea level. Rainfall at the top of the territory may be close to that of Sivepe, but further down it decreases--though I doubt whether it would fall much below 150 inches per year anywhere on Sangara territory. The land yielded much the same
361 wild and cultivated crops as in Sivepe. Before the eruption, the concentration of population was entirely at the higher reaches of this territory, while the lower parts were used for hunting and other subsidiary activities. Those who survived the eruption because they were away from their villages were often hunting on this lower land. Today, the pattern of occupation has shifted. The lower part of the territory, near the new villages, is intensively used while the more elevated land is used a little less and often for coffee rather than subsistence crops.

731 The eruption has made minor changes to land contours: due to the floods, the watershed of the Ambogo River was gouged out forming a number of pools of stagnant water which formed a breeding ground for mosquitoes and leeches. These pests are blamed on the eruption by the local people. On the credit side, certain varieties of bananas and pumpkins, planted before the eruption, had the opportunity to grow wild during the year the land was unoccupied and are now thought of as having been brought to the district by the eruption.

162 The total Sangara population today would be about 472--of which
161 350 live in Hohorita and the rest in the three other villages. The total land holdings of this population extend over 3.5 square miles--an average of about 135 per square mile. This places the Sangara in a somewhat superior economic position to Sivepe, which has to support at least 180 persons per square mile on land of the same quality. It must be remembered that prior to the eruption, the Sangara population was six times as large as it is today--so that Sangara must have suffered a chronic land shortage. All the neighbours of the Sangara are agreed that they were very warlike and dangerous enemies; they probably were in frequent need of extra gardening land. Today, they have enough land not only for subsistence gardening but also for a somewhat larger cash-cropping programme than is generally found in the Sasembata district.

621 The present site of Hohorita (see Map XIV)[A] developed in several
361 stages. First the Horsopa clan, which had the greatest number of survivors and therefore achieved dominance, shifted to the front part of Hohorita village in 1956. The mission station was established next to the village, separated from the village by a small stream. By 1958, all the Horsopa were settled in houses in the new village, together with the Oripa clan whom they had asked to join them while all the other inhabitants of Irihambo had shifted to the new mission

A [See Cat. 116, p. End Map 13--Analyst]

22: Schwimmer E-4,5 (1966-1967) 1969 QJ23 Orokaiva QJ23 Mount Lamington

[End Map 1]

Boundaries of Northern District

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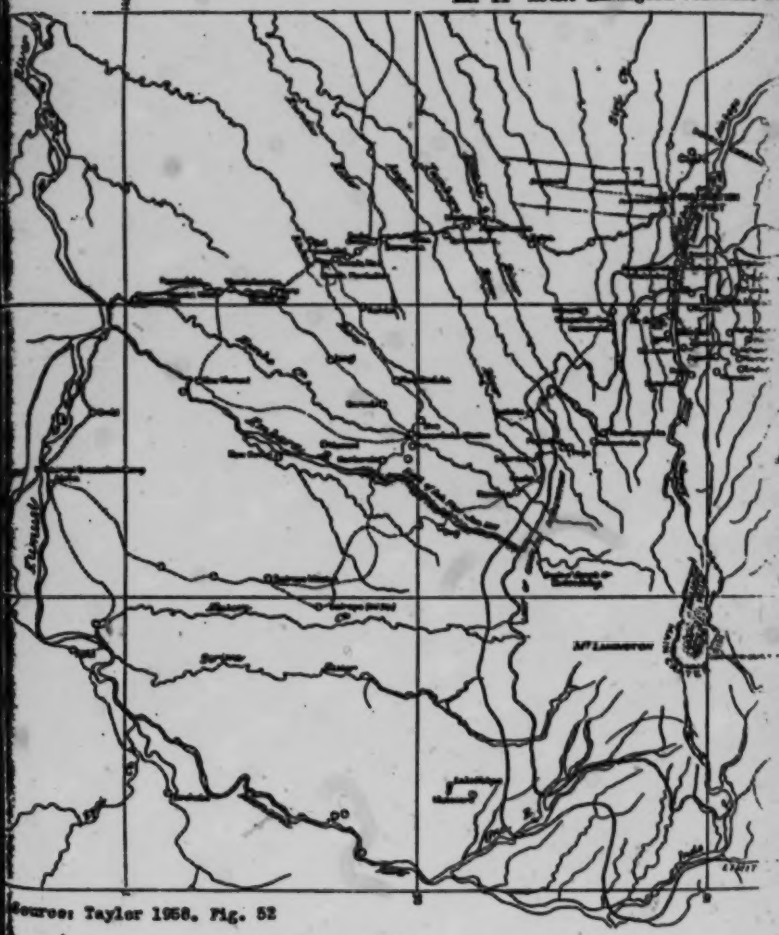
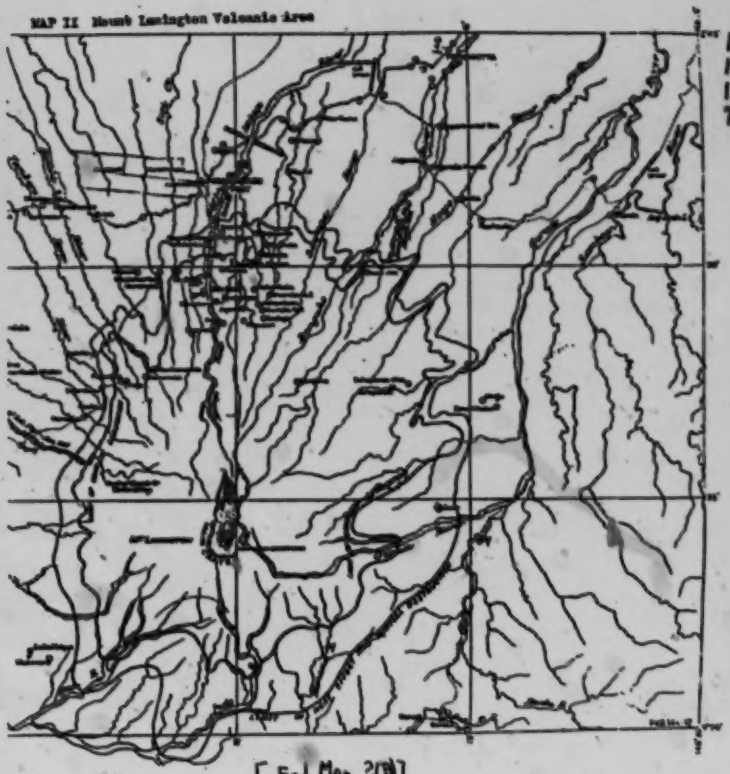
MAP II Mount Lamington Volcanic



Source: Taylor 1958. Fig. 52

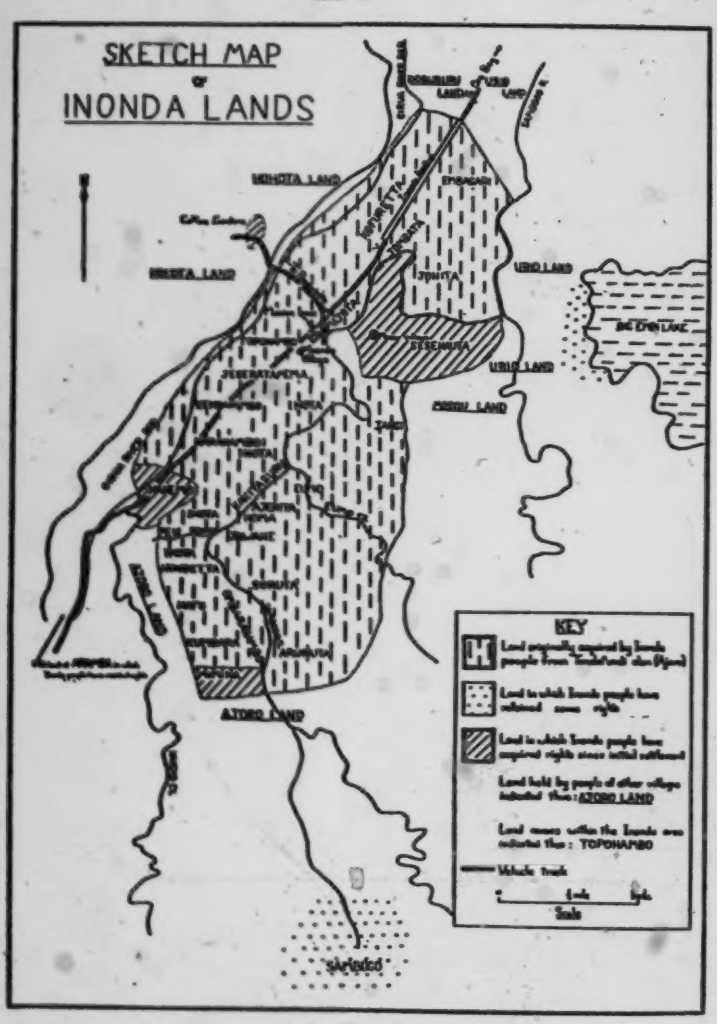
[End Map 2(A)]

22: Schwimmer E-4,5 (1966-1967) 1969 QJ23 Orokaiva QJ23
Mount Lamington



[End Map 2(B)]

MAP IV

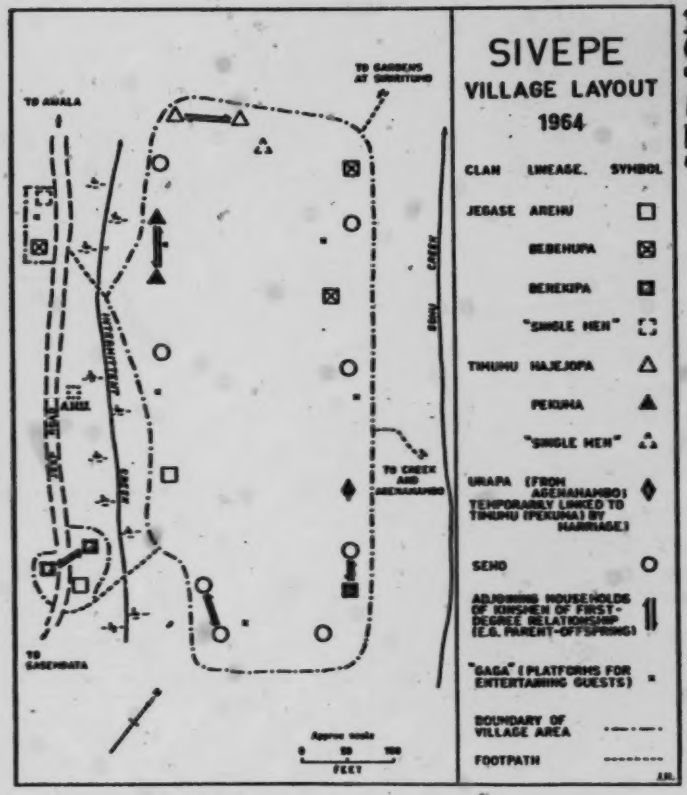


102
423
491
133
361

Source: Crocombe & Hogbin 1963 : 106.

[End Map 4]

Map V



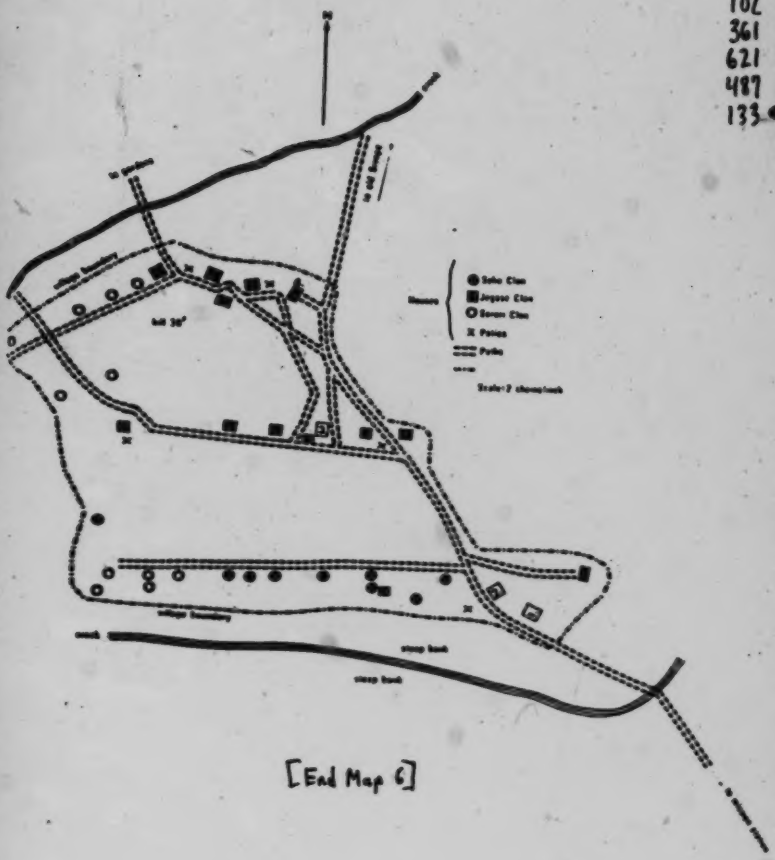
361
621
487
102
133
491

Source: Waddell & Krinks 1968: 38

[End Map 5]

Map VI
Plan of New Sivepo

102
361
621
487
133



[End Map 6]

Map IX

Source: Waddell & Krinks 1968: 34

[End Map 8]

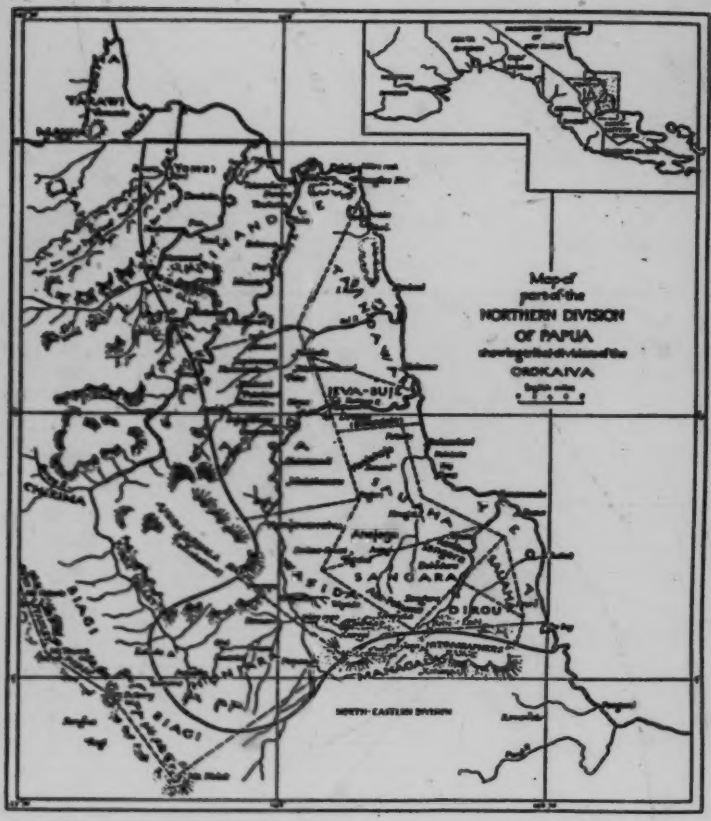
22: Schrimmer E-4,5 (1966-1967) 1969 QJ23 Orokaiva QJ23
Mount Lamington

102
131
133
344
368
491
497

22: Schwimmer E-4,5 (1966-1967) 1969 QJ23 Orokaiva QJ23
Mount Lamington

Map X

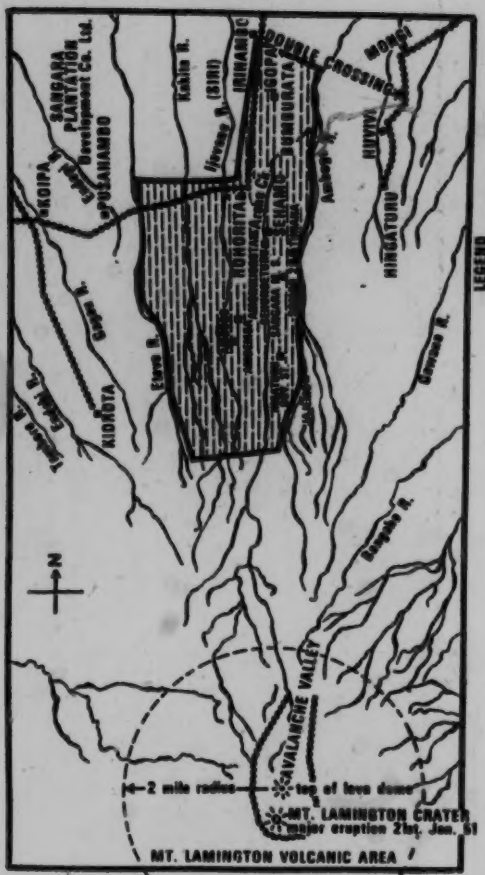
619
102
133
131



Source: Williams 1930

[End Map 9]

22: Schwimmer E-4,5 (1966-1967) 1969 QJ23 Orokaiva QJ23
Mount Lamington



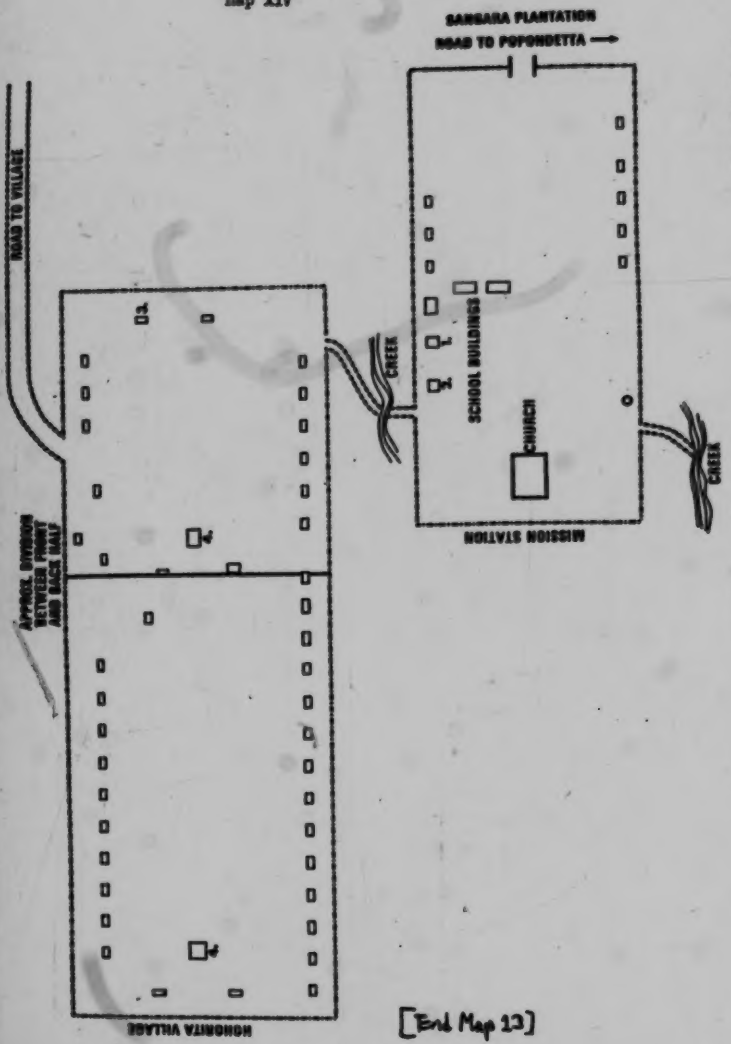
Map XIII

102
361
131
133 ●
491

[End Map 12]

22: Schwimmer E-4,5 (1966-1967) 1969 OJ23 Orokaiva OJ23
Mount Lamington

Map XIV



997
102
361
133
491

[End Map 13]

23: Keesing E-5 (1951) 1952
OJ23 Orokaiva OJ23

These so-called "mountain Orokaiva" have been described in considerable ethnographic detail by Williams.[2] Pioneer administrators considered them to be the most ferocious of New Guinea peoples. No tradition exists showing familiarity with vulcanism in the area, apart from one or two dubious hints in myth incident. The nearest volcanic outbreak occurred nearly a decade ago in the Tufi district, a considerable distance to the southeast. Mt. Lamington (5,634 ft.) with its irregular humps of old ash cones and its dense vegetation cover has always been regarded as being extinct. The Orokaiva worked their hamlets and gardens high up on the rich soil of its sprawling flanks, achieving perhaps the densest settlement patterns of any of the shifting "dry" cultivators in the New Guinea area.[3] They lacked any background conditioning to cushion the shock as did the whites who developed a Mission station, a Government coffee plantation, other "native" cooperative enterprises in the Sangara area, and, during the war, a mountain rest center which became the district headquarters at Higatura.

The first eruption came on a Sunday morning after three anxious days of earth tremors during which official and Mission personnel hesitated to frighten the people by suggesting evacuation. The eruption had the classic Mont Pele pattern: an exploding gas cloud engulfed an area of about eight miles in every direction and then sucked back. Hot ash covered a very much larger area, and the rivers whose sources are around the peak—the Kumusi, Amboga, and others well known for bitter fighting during the war—became choked with ash flows. The Higatura and Sangara centers on the north side caught the full blast and were virtually flattened, as it was this side of the mountain which blew out. Almost 100 percent casualties occurred in the area engulfed by the gas cloud. Since the bodies were often in good

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2. Williams, F. E., *Orokaiva Magic* (1928); *Orokaiva Society* (1930). The Orokaiva and their culture are also referred to extensively in Annual Reports of the Territory from 1890 on, particularly by Chinnery and Beaver in the 1914-15 and 1918-19 reports.

3. Williams speaks of the Lamington slopes as "thickly populated and with innumerable garden-clearings . . . one of the most fertile and beautiful in all Papua" (*Orokaiva Magic*, p. 110).

139 condition, it was assumed that death occurred by either
731 the outward blast or the inward backwash. The medical authorities made no post-mortems, however, being fully occupied with the problems of the survivors who poured out from their living sites further down the slopes, shocked, in a few cases very badly burned, and without immediate means of support.

731 A main government trail from Kokoda to the coast, which
[491] was widened into a military road during the war, winds over the shoulder of Lamington on its northwest side. Almost all of the evacuees headed for this road, some going west to the Wairopi crossing of the Kumusi river, others going north toward the coast. Within two days Government relief teams were flown to the area and were operating emergency camps in these two zones. Food, medicines and other supplies were sent in by way of adjacent airfields. The seriously injured were flown out to hospital centers. The first temporary encampments were condemned by the health authorities as they were in swampy or otherwise unsuitable settings; also the fear remained that they were too close to the source of possible further eruptions. Refugees on the west side were therefore moved back to a major camp at Ilimo. Those on the north (coastal) side were taken to two camps: the "Sangara" region people to Eroro, and the "Isivita" region people to Oro Bay. Emergency district headquarters were set up near the Popendetta airstrip on the north side, with an adjacent camp to stage the people back to resettlement areas. A government vulcanologist established a crude seismological station in a somewhat protected spot within the "closed" blast zone to bring the volcano under scientific surveillance.

In the areas that were most damaged and considered to be dangerous for an indefinite period because of their proximity to the active summit, practically all the occupants were killed. Government rolls of the survivors showed only some 400 as being from these settlements. Some were chance survivors in the more marginal zones, others were laborers, police, school children, or people who were visiting at the time. In the settlements lower down the mountainside and in the adjacent foothill and valley areas, casualties were sporadic and whole groups escaped unscathed. After the first panic of scattering, therefore, local groupings were able in the main to reassemble in the regional camps with such official aid as was necessary. Stray child survivors, including some infants, were readily taken under the care of other families, some of whom had lost children. In general, each group could be dealt with through its delegated leaders. Each was given its rations in bulk to use on its own responsibility and, where possible, accommodated as a unit even under crowded emergency conditions.

133 A second major eruption came on March 5. New ash
731 cone accumulated and blanketed the area, but there were no further casualties. Later that month, at the time of the writer's visit, the smoking peak had another great ash cone building up. There were minor ash eruptions in and around the crater and massive ash flows were occurring down the river courses; vegetation was burnt and water rendered unfit for use many miles into the zone of the surviving green forest and savanna. Uncertainty as to further possible

133 731 eruptions has subsequently continued, and reports as of December, 1951, show a persistence of these conditions and a recurrence of bad earth tremors. In other words the Orokaiva, Government and Mission are having to learn to live with the volcano for an indefinite period.

731 241 An observer passing through or flying over destroyed areas was struck by the fact that plants with large fleshy foliage such as taro (the staple food of the Orokaiva) and bananas tended to green over quickly. Root crops indeed sometimes showed accelerated growth, presumably through combined ash-rain fertilization, though considerable rotting set in later. Squads of men were organised to go into the more accessible areas within the blast perimeter to gather such surviving crops, though they were not permitted to stay overnight. These foodstuffs supplemented the official rations which consisted of rice, canned meat, some wheatmeal, peas, salt, sugar, and tea in generous quantity.

731 Within two months the whole situation was becoming reasonably "structured." The Government vulcanologist had defined a danger zone from eight to 12 miles around the active crater; no individual could go inside this area except with an official pass, and then only by day and for good reason. Those groups whose living sites were outside this closed area, or who could get land from relatives or others, were being allowed to resettle under conditions closely prescribed by supervising Government officers (this will be enlarged upon later in this paper). On this basis, some 2,500 persons had already left the refugee camps, though they were still being rationed to some degree. The "Sangara" people had been transported back inland from the Eroro camp to the Popendetta camp and adjacent zones within a few miles of their homes. The "Isivita" people at Oro Bay, numbering some 600, were being transported in batches of some 35 persons every other day by launch from the Oro Bay camp to Killerton, by truck to the Popendetta camp, then by small Dragon Moth plane to the Kokoda airstrip. From here they walked the approximately 20 miles to the Ilimo camp on the western side of the mountain where they had lived formerly. The Oro Bay camp was in this way closed down by May. At Ilimo, some 2,000 persons were living either in the first temporary huts such as the Orokaiva build for emergency or short-term housing, or in large newly-constructed houses of a more permanent type. (Somewhat later this camp population was reduced to about 1,500, comprised essentially of the surviving people from the west side of the mountain whose homes were in the closed-off area and who had not been able to find resettlement places outside). The Ilimo camp had a staff of some 14 white officials, aided by Papuan police and other assistants. In addition to the various welfare activities, there were schools for children and adults, sports, a community hall, and a large block of garden land broken in with tractors and other modern tools. Government was using it as an experiment in "community development" as well as a relief center.

731 657 177 [361] By that time, too, a whole series of policy problems had arisen which both the field staffs and the Australian authorities at Canberra and Port Moresby were trying to resolve. Most serious was the question of how far the crucial break with the past should be used as an opportunity to encourage

[P.17-B]

why were they so anxious to return home where they could no longer be instructed in its practices? The answer seems to lie in the land tenure problem, discussed later, which was reflecting fundamental structural changes in the society. But why was this problem passed over in silence in all the statements about the "new age" recorded for the period immediately after the eruption? The answer to this question may be mere speculation, but it is clear that by excluding land tenure from our analysis, we shall become the victims of our informants' own mystifications, which is all the more regrettable since, by 1966, Orokaiva ideologists had recognized the importance of the land tenure problem for the setting up of the "new age." Our final analysis is therefore based on an unconscious model which includes this factor.

THE EVENT AND ITS SETTING

On 21 January 1951, Mount Lamington, a mountain situated in the Northern District of Papua, was torn apart by what is technically known as a Pelean eruption. A paroxysmal explosion burst from the crater and produced a *nuée ardente* which completely devastated a surrounding area of 68 square miles (Taylor 1958:7).[a] Almost 4,000 people, mostly belonging to the Orokaiva-speaking group of tribes of the Northern District, were killed. The word "Orokaiva" is used here to designate speakers of the Orokaiva language, resident in an area roughly coinciding with the Popondetta, Sohe Popondetta, and Saiho census divisions (see map 1).[b] This area comprises the foothills of Mount Lamington and the alluvial plains to the north and east. The area is rather homogenous in culture, and dialect differences are minor. Destruction in this inner zone of devastation was almost complete. A further 22 square miles were partially devastated, and it was from this area that some 3,000 inhabitants were able to save themselves by running away from the *nuée ardente*. The population of the Mount Lamington foothills, within a radius of at least 10 miles from the crater, fled from their villages as the explosion threw stones over all the area, destroyed the administrative center at Higaturu, and blotted out the light of the sun.

It was at this point that the administration of the Territory of Papua intervened. Australian authorities sent in supplies for the

A [See Category 102, p. 303--Analyst]

24: Schwimmer E-5 (1966-1973) 1977
OJ23 Orokaiva OJ23

Map 14. Mount Lamington, Papua.

survivors, established camps to house them, and set up a volcanological observation post. Acting on technical advice that further explosions were to be expected, the administration at once restricted access to a fairly wide area surrounding the crater, thus forbidding most of the fugitives to return to their homes. It was at this stage also that the administration called in two anthropologists, Felix Keesing and Cyril Belshaw, for advice on what should be done with the now homeless population.' Shortly after the two anthropologists left the scene in May 1951, volcanological studies indicated that the active, paroxysmal stage of activity of Mount Lamington had ceased and hence that a large part of the restricted area could be resettled. In March 1953, it was possible to reduce the restricted area still further, to a circle of 2 miles surrounding the crater. As a result of these events, virtually all arable land in the district was in use when I visited in 1966–1967. There were no displaced communities in the proper sense of the word. There had been movements of villages from the crater area to consolidated settlements in the vicinity of paved roads, but here convenience

24: Schwimmer E-5 (1966-1973) 1977
OJ23 Orokaiva OJ23

1. In the Mount Lamington case, the institutional approach would produce results somewhat similar to Lessa's in his excellent paper "The Social Effects of Typhoon Ophelia (1960) on Ulithi" (1964). The major innovations over the last thirty years were due not to the eruption but to the Japanese invasion, the subsequent expulsion of the Japanese by Allied forces, the introduction of large-scale cash cropping, increased urban migration, and the development of officially supported indigenous political institutions.

   The exchange theory approach of Blau and Barth has been followed to some extent in the present essay, but as Garbett (170:225) remarks in the essay already referred to: "Unless one wants to treat situations as simply another kind of 'small group' in an extra-laboratory setting for the testing of propositions from exchange theory, one's findings have to be related to, and set in, a wider context presumably studied by other methods."
2. For semiological discussion on the Road Code, see Lévi-Strauss (1958:chap. 5) and Leach (1970:chap. 2).
3. As an illustration of connotative systems, Barthes (1964a) analyzes a full-color advertisement for grated cheese, spaghetti, and tomato paste and shows that the items in the picture are so displayed as to connote all the delights of a carefree life in sunny Italy where foods are sweet, fresh, unadulterated, and perfect in appearance.
4. The relationship between signifier and signified suggested here may not be peculiar to "the savage mind" but universal, as is suggested by Lacan (1966: 493–528).
5. One of the first useful studies of regional colonial macrosystems known to me in New Guinea ethnography is Burridge (1960), which indicates clearly the modalities of conflict and alliance in the Papuan–administration–missionary triangle. Extremely important also is Fredrik Barth's work on polyethnic systems (1969) and on forms of regional organization in New Guinea (1971).
6. The term "Pelean eruption" is applied to the type that occurred at Mount Pelée (St. Pierre, Martinique) in 1902. A large mass of ash is projected rapidly into the stratosphere to form an expanding mushroom-shaped cloud. The base of the column begins to expand rapidly as clouds of incandescent ash (the *nuée ardente*) avalanche down the slopes. The *nuée ardente* is lethal because of sudden damage to the respiratory system caused by inhaling hot (200°F) dust.
7. The reports written by these two scholars (Belshaw 1951; Keesing 1952) led to the inclusion of the case of the Mount Lamington Orokaiva in the project directed by H. G. Barnett and entitled "A Comparative Study of Cultural Change and Stability in Displaced Communities" (1961).
8. Here and throughout this essay I use the term "structure" in the sense of Lévi-Strauss (1958:chap. 15).
9. I have used British terminology in most of this essay as it seems hazardous to adopt American terms in a British-French conceptual framework. Where I use clan, American anthrolopologists would usually write "sib." The term "local clan group" refers to a coresident segment of a dispersed clan (or sib). A full discussion may be found in Schwimmer (1970a).